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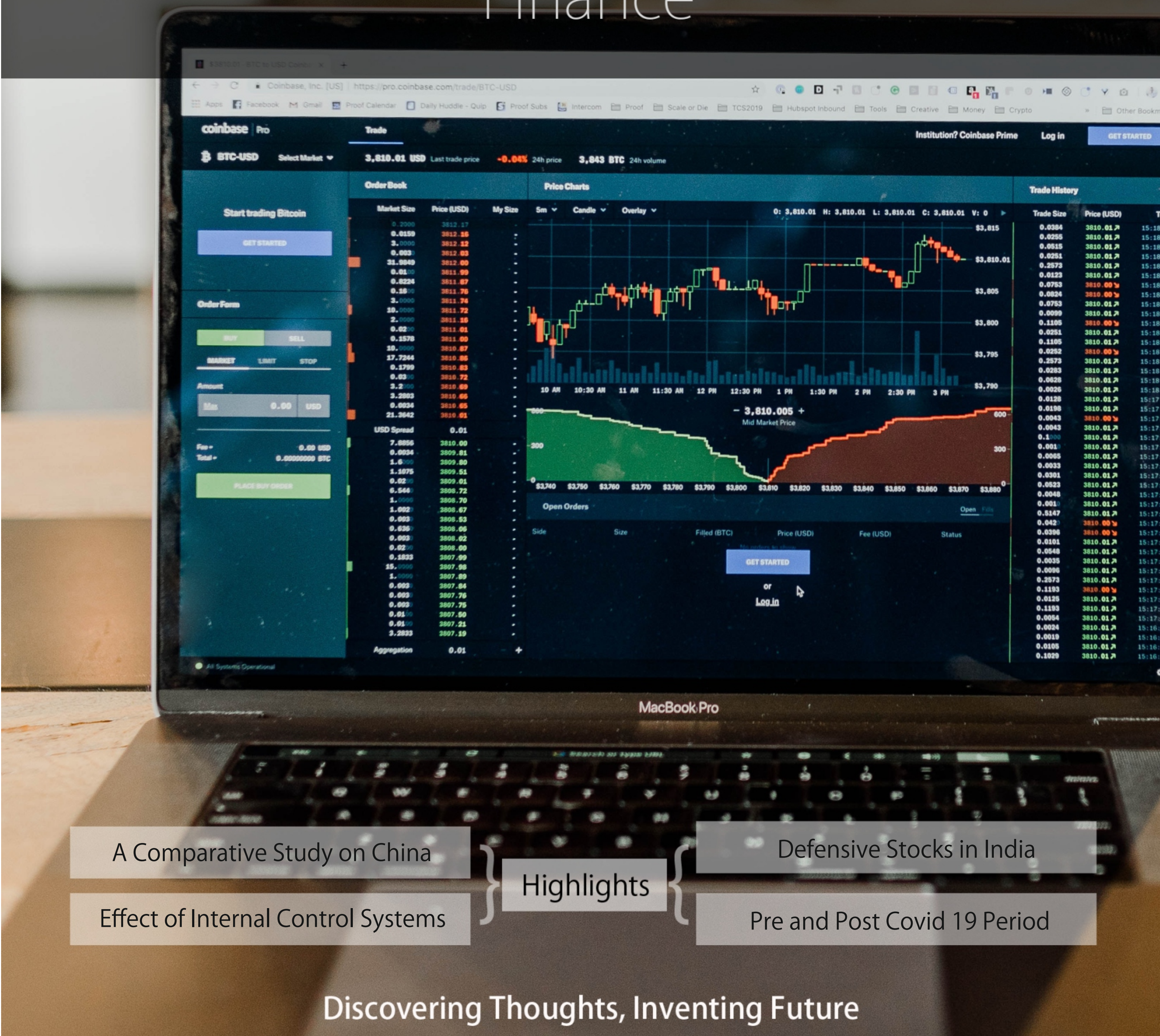

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Evaluation of Value-at-Risk and Expected Shortfall Measures in Market Risk Management

By Isam Mouallim
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Abstract- This paper has object to examine the empirical performance of market risk measurement innew Fundamental Review of the Trading Book (FRTB) regulation. Through an empirical study, we analyze the predictive performance of the Value-at-Risk (VaR) and Expected Shortfall (ES) models by using backtesting procedures for 2007-2012 periods (US subprime Mortgage Crisis and European Sovereign Debt).The applied methodology includes analyzes, synthesis and statistical/econometric methods. The empirical results show a clear outperformance of Expected Shortfall (ES) measuresthanValue-at-Risk (VaR) measures.Another important result is the backtesting procedure recommended by Fundamental Review of the Trading Book (FRTB) regulation penalizes the recommended market risk measurement.

Keywords: *VaR, expected shortfall, FRTB, backtesting.*

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EVALUATIONOFVALUEATRISKANDEXPECTEDSHORTFALLMEASURESINMARKETRISKMANAGEMENT

Strictly as per the compliance and regulations of:

Evaluation of Value-at-Risk and Expected Shortfall Measures in Market Risk Management

Evaluation De La Var Et L'es Dans La Gestion Du Risque De Marché

Isam Mouallim

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Keywords: VaR, expected shortfall, FRTB, backtesting.

Résumé- Le présent travail s'inscrit dans une perspective d'examiner la performance empirique et comparative des méthodes d'évaluation du risque de marché dans le cadre de la nouvelle réglementation «Fundamental Review of the Trading Book ou FRTB». À travers une étude empirique, nous étudions la performance prédictive au moyen de procédures de backtestingdes estimations Value-at-Risk (VaR) et ExpectedShortfall (ES) en fonctiondes mesures du risque multivarié pour la période de 2007-2012. Cette période prend en considérationla crise des subprimes aux États-Uniset la crise des dettes souveraines en Europe.La méthodologie appliquée comprend des analyses, des synthèses et des méthodes statistiques/économétriques. Les résultats empiriques montrent une nette surperformance des méthodes de mesure de l'ES par rapport à celles de la VaR.Un autre résultat dégagé est lié au fait que la procédure du backtesting recommandée par le régulateur dans le cadre de FRTB pénalise la mesure du risque de marché ExpectedShortfall (ES).

Mots-clés: VaR, expected shortfall, FRTB, backtesting.

I. Introduction

La crise financière de 2007-2012a révélé une grande faiblesse des systèmes bancaires et financiers mondiaux en matière de l'évaluation et la gestion du risque de marché. Elle a mis en exergue les failles structurelles de la régulation bancaire et financière et leurs incapacités de mesurer correctement le risque systémique en période de forte volatilité, pourtant les dispositifs de surveillance du risqué de marchépossé daientplus de dix ans d'expérience après les différents travaux du comité de Bâle et la mise en œuvre généralisée des systèmes de contrôle des risques. Dans cecontexte, les autorités de régulation ont profité de la situation pour renforcer leurs exigences de contrôle, fondées jusque-là sur la «Value at Risk - VaR» et les stress tests. Dans un premier temps, elles ont instauré, en décembre 2011, une série des réformes desméthodes d'évaluation du risque de marché connues sous le nom de Bâle 2.5. La méthodeVaR de Bâle IIa été complétée par trois nouvelles mesures du risque de marché: la stressedVaR, l'Incremental Risk Charge (IRC) et la Comprehensive Risk Measure (CRM).Cependant, ces nouvelles mesures ont rendu le texteréglementairemoins cohérentvis-à-visde la mesure globale du risque de marché qui est devenueconfuse et difficile à comprendre. Ensuite, un certain nombre de révisions du cadre réglementaire ont été lancés: quatre études d'impact quantitatives et trois documents consultatifs, dont la version finale, connue sous le nom«Fundamental Review of the Trading Book ou FRTB», a été publiée en janvier 2016 et prévued'entrée en vigueur au 1er janvier 2023, sous réserve d'être adoptée et mise en application par les banques centrales.

La FRTB apporte une refonte complète. Quatre grands axes sont au cœur de cette réforme:

1. Redéfinition, selon des règles strictes, la frontière entre le trading book et le banking booken la rendant plus claire.
2. Introduction d'une nouvelle approche de mesure du risque de marché qui repose non plus sur la VaRet la StressedVaRmais sur le modèle de l'Expected Shortfall (ES). Le recours à l'ES permettra de mieux prendre en compte les pertes extrêmes et les queues de distribution épaisses.
3. Révision de l'approche fondée sur les modèles internes en instaurant son application à l'échelle de chaque desk de tradingplutôt qu'à l'échelle globaleet en renforçantles règles de validation des modèles interne au moyen des procédures dubacktestingavec la possibilité d'introduire des critères supplémentaires.
4. Incorporation du risque d'illiquidité du marché.

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Dans le cadre de l'évaluation du risque de marché, le FRTB insiste sur l'utilisation de l'ExpectedShortfall (ES) au seuil de 97.5% au lieu de la VaR au seuil de 99%. Or, dans un monde gaussien,les deux mesures sont presque équivalentes puisque le quantile de la VaR à 99% est 2.326 et le quantile de l'ExpectedShortfall (ES) à 97.5% est de 2.338. En revanche, pour une distribution des rendements avec des queues plus épaisses qu'une distribution normale, la valeur de l'ExpectedShortfall (ES) peut être considérablement supérieure à la VaR.Dans ce contexte, nous nous intéressons aux modèles d'évaluation du risque de marché ainsi qu'à leurs faiblesses tout en proposant des solutions pratiques permettant de combler leurs insuffisances. En considérant les approches Value-at-Risk (VaR) et ExpectedShortfall (ES) comme les mesures standards du risque de marché pour les autorités de régulation des marchés financiers et pour l'ensemble des institutions financières et bancaires, nous nous interrogeons sur leur efficacité empirique dans la pratique de l'évaluation du risque de marché; un sujet d'actualité qui est devenu particulièrement important dans la conjoncturedescrises financièresoù l'explosion de la volatilité des différentesclasses d'actifs avait tendance à rendre les investisseurs et les autorités de régulation desmarchés financiers averses aux risques.

Dans ce travail, nous nous focalisons sur l'approche paramétrique des méthodes d'évaluation du risque de marché où la volatilitéest un inputcrucial. Nous proposons des modèles d'estimation de la volatilité multivariés capables de reproduire les faitsstylisés exhibés par les changements de prix d'actifs financiers pour mesurer le risque demarché. Plus précisément, nous effectuons une étude empirique comparative en utilisant la spécificationExponentiallyWeighted Moving Average Covariance(EWMA Covariance),le modèle de la Corrélation Conditionnelle Constante (CCC), le modèle de la Corrélation Conditionnelle Dynamique (DCC) et le modèle DCC Asymétrique (ADCC)afind'estimer la VaR et l'ESdumarchépourla période du temps 2000-2012.Le choix de cette période du temps constitue un critère pertinent pour tester la qualité prédictive des mesures du risque de marché. Elle est considérée comme la plus stressante dans l'histoire du capitalisme puisqu'elle intègre la crise dessubprimes2007-2008 et la crise des dettes souveraines 2009-2012.À travers cela, nous cherchons à présenter aux investisseurs, aux risk managers, ouencore aux autorités de régulation des marchés, des outils de mesure du risque, mieuxadaptés à leurs objectifs, afin d'éviter toute sur-estimation et sous-estimation qu'impliquel'emploi des indicateurs de risque usuels. Ensuite, nous testons la qualité prédictive des mesures du risque adoptées au moyen des procédures de backtestingen vue d'examiner leurs performances empiriques dans le cadre de l'évaluation et la gestion du risque de marché. Nous abordons deux méthodes du backtesting: la première repose sur les méthodes de backtestingrecommandée par le régulateur, la deuxième utilise certains tests statistiques.

La suite de ce travail est organisée de la manière suivante: la section 2 fournit une revue de littérature. La section 3 fournit une description des différents modèles de quantification de la VaRet de l'ESet les procédures de backtesting des modèles dont nous cherchons à tester la pertinence. La section 4 présente les résultats de l'étude empirique des différents modèles de mesure du risque de marchéet les résultats dubacktesting.

II. Revue de Littérature

L'examen de la littérature des méthodes d'évaluation du risque de marché par la Value-at-Risk (VaR) et l'Expected Shortfall (ES) révèle qu'il y a peu de travaux de recherche empiriques qui ont traité cette problématique. En effet, il existe une littérature abondante sur la VaR qui a fourni plusieurs méthodes d'évaluation de la VaR (Giot & Laurent (2004), Chiou & Lin (2006), Pérignon & Smith (2008), Komunjer (2013) et McNeil et al. (2015), McMillan & Speight (2007)). Cependant, si depuis longtemps on considère que l'ExpectedShortfall (ES) est une mesure "cohérente" du risque de marché (Artzner et al. 1999), en revanche, contrairement à la VaR, la littérature contient relativement peu de méthode d'évaluation de l'ES.Cela peut être expliqué par le fait que depuisl'émergence de la VaRcomme étant la mesurestandard du risque de marchérecommandée par les autorités réglementaires, les travaux de recherche se focalisent plus sur l'évaluation de la VaRau détriment de l'évaluation de l'ES dont l'intérêt réglementaire n'est que récent.Dans la littérature financière, il existe peu d'articles comparant les méthodes d'évaluation du risque de marché par la Value-at-Risk (VaR) et l'ExpectedShortfallES.Basak et Shapiro (2001) montrent qu'en cas de perte importante, l'évaluation et la gestion du risque via l'utilisation de l'ES conduisent à des pertes moins importantes que la VaR.Inui et Kijima (2005) développent des arguments théoriques en faveur de l'utilisation de l'ES au détriment de la VaR.Yamai et Yoshiba (2005) font une comparaison pratique entre VaR et ES, leurs conclusions indiquent quela VaR sous-estimeles pertes extrêmes par rapport à l'ES. Taylor (2008) proposeune nouvelle méthode économétri que appelée "exponentially weighted quantile regression" pour estimerl'ES. Pour l'auteur, la nouvelle méthode d'évaluation de l'ESsuperforme la VaR.Angelidis et Degiannakis (2007) ont utilisé une famille des modèles GARCH pour évaluer laVaRet ESde l'indice S & P 500. Les auteurs trouvent que les modèles APARCH et EGARCH ont donnéde meilleures prévisions. ALOUI et al (2015) ont étudié la performance de la VaR et l'ES via les modèles GARCH asymétriques et les modèles

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GARCH à mémoire longue sur les marchés boursiers des pays de golf. Leurs résultats révèlent que le modèle de volatilité FIAPARCH est le mieux adapté à l'estimation de la VaR et l'ES.

III. Méthodologie de Recherche

a) Value-at-Risk (VaR)

La méthodeVaR représente un niveau de perte Lqui ne sera dépassé durant une période temporelle qu'avec un certain degré de confiance α. La Value-at-Risk (VaR) paramétrique, pour une durée tet au seuil de probabilité α, est définie comme (Jorion 2006):

$$\mathrm{P}[L \leq VaR_\alpha] = \alpha$$

En admettant que la distribution des rendements suive une loi normale, la VaR peut s'écrire de la manière suivante:

$$VaR_\alpha = N^{-1}(\alpha)\sqrt{h_t}$$

Avec Nla fonction de distribution cumulative normale, $N^{-1}(\alpha)$ le quantile de la loi normale et h_t La variance conditionnelle des rendements.

b) Expected Shortfall (ES)

Expected Shortfall (ES), appelée également la ConditionalValue-at-Risk (CVaR), a été proposé pour la première fois par Artzner et. al.(1997). Elle est définie comme l'espérance conditionnelle des pertes au-delà du niveau de la VaR.ExpectedShortfall (ES) paramétrique au seuil de probabilitéα, est défini comme:

$$ES_\alpha = \frac{\Phi[N^{-1}(\alpha)]}{1-\alpha}\sqrt{h_t}$$

Où Φest la fonction de densité de probabilité, N^{-1}l a fonction de répartition inverse d'une loi normale et h_t La variance conditionnelle des rendements.

Dans le cas d'un portefeuille de n actifs, la volatilité deportefeuille est exprimée par la formule suivante $\sqrt{W^T H_t W}$ où $W = [w_{1,t}, w_{2,t}, \dots, w_{n,t}]$ est levecteur des poids de chaque actif du portefeuille et H_t la matrice variance covariance conditionnelle.

c) Modèles de la volatilité multivariés

Définition 1: Le modèle EWMA Covariance de RiskMetricsspécifie la covariance conditionnelle de la manière suivante:

$$H_t = \lambda H_{t-1} + (1-\lambda) r_{t-1} r_{t-1}^{'}$$

Avec le r_t le processus des rendements.Le coefficient λ fixé par le système RiskMetricsà 0.94 pour les données journalières.

Définition 2: Le modèle CCC de Bollerslev (1990) définitla matrice variance-covariance par l'équation suivante:

$$H_{i,j,t} = \rho_{i,j}\sqrt{H_{i,i,t} H_{j,j,t}}$$

La notation matricielle est:

$$H_t = D_t R D_t$$

Avec D_tla matrice diagonale des volatilités conditionnelles et $R = \rho_{i,j}$ la matrice descorrélations conditionnelles constantes.L'hypothèse fondamentale du modèle CCC est que les corrélations conditionnelles sont constantes dans le temps.

Définition 3: Le modèle DCC de Engle (2002) définit la matrice de corrélation conditionnelle dynamique R_tcomme:

$$H_t = D_t R_t D_t$$

$$R_t = diag\{Q_t\}^{-1/2} Q_t \, diag\{Q_t\}^{-1/2}$$

Où la matrice quasi-corrélation Q_t de dimension $N \times N$ est spécifiée de la manière suivante:

$$Q_t = (1-\alpha-\beta)\bar{Q} + \alpha z_{t-1} z_{t-1}' + \beta Q_{t-1}$$

Avec $z_{it} = \varepsilon_{it} / \sqrt{h_{iit}}$ les résidus standardisés, $\overline{Q}$ la matrice covariance inconditionnelle des z_t et α, β les paramètres du modèle à estimer soit positive définitivement et que $(1-\alpha-\beta) > 0$.

Définition 4: Le modèle ADCC de Cappiello, Engle et Sheppard (2006) prendre en considération le phénomène de l'asymétrie dans le modèle DCC en permettant à la dynamique de la corrélation de réagir aux chocs négatifs et positifs des rendements financiers.

Dans le modèle ADCC, Q_t est spécifiée de la manière suivante:

$$Q_t = (1-\alpha-\beta)\bar{Q} - \gamma\bar{N} + \alpha z_{t-1} z_{t-1}' + \gamma \eta_{t-1} \eta_{t-1}' + \beta Q_{t-1} \eta_t = min[z_t, 0]$$

Avec le coefficient γ exprime l'asymétrie dans la corrélation qui caractérisel'effet d'un choc négatif sur la corrélation conditionnelle et $\overline{N}$ la matrice de covariance inconditionnelle de η_t.

La méthode utilisée pour estimer les paramètres des modèles est celle de quasi-maximum de vraisemblance (QMLE).

d) Backtesting Value at Risk

➢ Traffic Light Test (TL test)

Le Traffic Light test (TL test), imposé par le comité de Bâle (1996) dans le cadre de la procédure de backtesting devalidation du modèleinterne, repose sur le calcul dunombre « exceptions » en fonction de trois zones de différentes couleurspour la validation du modèle interne:

- Les modèles de green zone qui affichentunnombre d'exceptionsinférieur à 4ne remettent en cause ni la qualité ni la précision du modèle.
- Les modèles de yellow zonequi affichent unnombre d'exception entre 5 et 9 suscitent quelques interrogations sur leur qualité prédictive sans conclusion définitive.
- Les modèles de red zonequi affichent unnombre d'exceptionssupérieur ou égaleà 10 dont la qualité prédictive du modèle n'est pas validée par le régulateur. Dans ce cas la banquedevrait revoir son modèle d'évaluation du risque.

➢ Test de Kupiec

Le test de couverture inconditionnelle de Kupiec (1995) est un test bilatéral basé sur le nombre des exceptions.Kupiec a introduit deux tests: Proportions Of Failures test (POF Test) et Time Until First Failure (TUFF Test).

Le POF test examine la fréquence despertes supérieures à la VaR. La statistique de POF test est la suivante:

$$LR_{POF} = -2log\left(\frac{(1-p)^{N-x}p^x}{\left(1-\frac{x}{N}\right)^{N-x}\left(\frac{x}{N}\right)^x}\right)$$

Avec x est le nombre des exceptions, Nest le nombre des observations et p=1-VaR level. La statistique LR_{POF} suit une loi Khi-deux à un degré de liberté. Le modèle VaRest considéré non-valider si LR_{POF} dépasse une valeur critique.

Le test TUFF (Time Until First Failure)mesure le tempsnécoulé pour que la première exception se produise. La statistique du test est:

$$LR_{TUFF} = -2log\left(\frac{p(1-p)^{n-1}}{\left(\frac{1}{n}\right)\left(1-\frac{1}{N}\right)^{n-1}}\right)$$

La statistique LR_{TUFF} suit une loi Khi-deux à un degré de liberté. Si la statistique de test est inferieur à la valeur critique, le modèle est accepté et, dans le cas contraire, le modèle est rejeté.

➢ Christoffersen test

Le test de Christoffersen (1998) mesure l'indépendance des différentes exceptions du modèle VaR adopté. La statistique de ConditionalCoverage Independence test de Christoffersen LR_{CCI} est:

$$LR_{CCI} = -2log\left(\frac{(1-\pi)^{n_{00}+n_{10}}\ \pi^{n_{01}+n_{11}}}{(1-\pi_0)^{n_{00}}\pi_0^{n_{01}}(1-\pi_1)^{n_{10}}\pi_1^{n_{11}}}\right)$$

Avec πla proportion des exceptions observées, π_0 la proportion des exceptions qui suivent un jour où aucune exception ne s'est produite et π_1 la proportion des exceptions survenantaprès une précédente exception. n_{ij} le nombre des exceptions avec une valeur indicatrice i suivi par une valeur indicatrice *j*, pour $i,j = 0,1$. La fiabilité d'un modèle VaR est rejetée lorsque la statistique LR_{CCI} est supérieure à la valeur critique du khi-deux 1 degré de liberté.

Conditional Coverage test (CC test) de Christoffersen combine à la fois le test CCI de Christoffersen et le test POF de Kupiec pour tester la validité ou non des modèles VaR.La statistique de test est:

$$LR_{CC} = LR_{POF} + LR_{CCI}$$

La fiabilité d'un modèle VaR est rejetée lorsque la statistique LR_{CC} est supérieure à la valeur critique.

e) Backtesting Expected Shortfall

Acerbi et Szekely (2014) ont proposé une nouvelle méthode statistique pour backtester l'expectedshortfall (ES). Ils définissent trois statistiques du test, chacune avec des hypothèses différentes. Les test Z_1 ettest Z_2 rendent l'estimation pratique de la statistique du test plus facile que les autres tests.

Les hypothèses des tests sont:

- H_0: $P_t^{[\alpha]} = F_t^{[\alpha]}$ Null: model is perfect
- H_1: $ES_{\alpha,t}^F > ES_{\alpha,t}^P$ Alternative: ES underestimated

Avec $F_t$la distribution réelle (non observable) des séries de rendements qui est inconnue et P_t la distribution théorique des modèles utilisés. Les statistiques des tests Z_1 et Z_2 de Acerbi et Szekely (2014) sontlessuivantes:

Test 1: Testing ES after VaR

$$Z_1 = \frac{\sum_{t=1}^{T}\frac{LI_t}{ES_{\alpha,t}}}{\sum_{t=1}^{T} I_t} + 1$$

Test 2: Testing ES Directly

$$Z_2 = \sum_{t=1}^{T}\frac{LI_t}{T\alpha ES_{\alpha,t}} + 1$$

Avec *T* le nombre des observations et *L* niveau de pertepour un portefeuille. Les statistiques Z_1 et Z_2 sontsensibles à la fois à l'ampleur et la fréquence des exceptions.

IV. Données & Résultats Empiriques

a) Données et analyse statistique

Pour mener notre étude empirique, nous disposons un historique des séries des rendements d'un portefeuille composé de six indices boursiers. Il s'agit des données journalières sur un historique des prix de clôture des indices boursiers internationaux suivant: l'indice CAC 40 (CAC), l'indice DAX (DAX), l'indice S&P 500 (SP500), l'indice NASDAQ (CCMP), l'indice FTSE 100 (UKX) et l'indice Nikkei (NKY). L'ensemble des données sont exprimées en valeurs journalières. La période de l'étude s'étend du 05 janvier 2000 au 31 décembre 2012, soit 3330 observations. Ces cours étaient fournis par la base de données de Bloomberg. Les séries d'observations ont été ensuite transformées en séries des rendements logarithmiques, ce qui confère aux valeurs une structure de taux de variation.

Les séries de rendement des indices boursiers d'actions et de portefeuille, figure (1), indiquent une forte volatilité surtout en période de crise des subprimes 2007-2008 et de crise des dettes souveraines 2009-2012. On observe clairement une présence du phénomène «volatility clustering», phénomène constaté pour la première fois par Mandelbrot (1963), ce qui suggère une présence de la propriété d'hétéroscédasticité. Les valeurs n'exhibent pas de tendance. Elles semblent être stationnaires en moyenne mais pas en variance. Ce regroupement de volatilité est dû à la corrélation des rendements des actifs financiers. Ces intuitions sont vérifiées par l'application des tests statistiques.

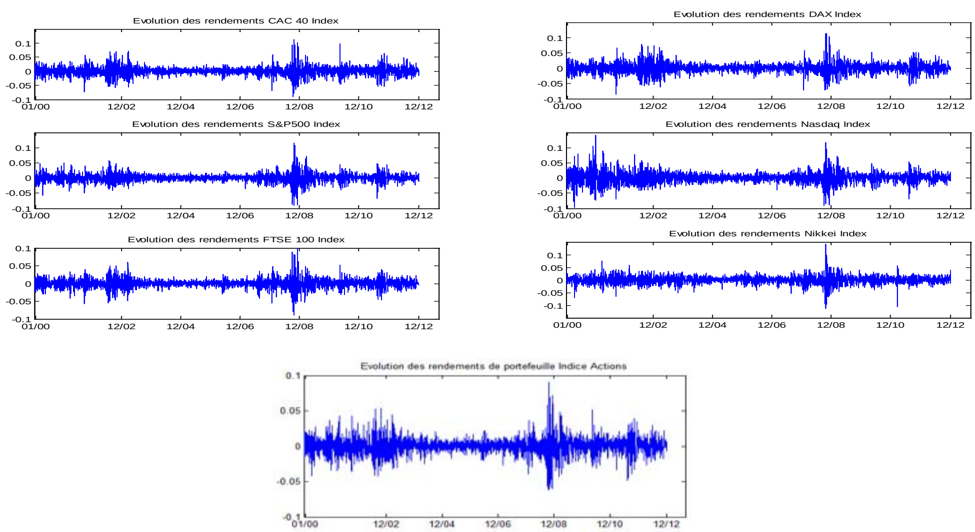

Figure 1: Évolution des séries de rendements

L'analyse statistique des rendements, tableau (1), des actifs étudiés plaident pour une distribution empirique dite leptokurtique par rapport à une distribution gaussienne. En effet, le coefficient du kurtosis est très élevé pour toutes les séries des rendements. Cet excès de kurtosis signifie que les distributions présentent des queues plus épaisses que celles de la loi normale, elles sont dites leptokurtique. La valeur duskewness est différente de zéro ce qui est un signe de la présence des structures non linéaires dans le processus générateur des rendements, puisqu'on sait que les modèles linéaires gaussiens sont nécessairement symétriques.Ces résultats suggèrent que les distributions empiriques des rendements des différents actifs ne peuvent être assimilées à celles de la loi normale. Ce constat est confirmé par les tests d'adéquation de Jarque-Bera (test de normalité).

Tableau 1: Statistiques des rendements journaliers

	CAC	DAX	SPX	CCMP	UKX	NKY	Index PF
Mean	-1.05E-05	1.74E-04	9.49E-05	8.04E-05	4.61E-05	-6.40E-05	5.35E-05
Volatility	0.0157	0.0162	0.0134	0.0178	0.0129	0.0153	0.01171
Min	-0.0904	-0.0849	-0.0903	-0.0967	-0.0885	-0.1141	-0.06153
Max	0.1118	0.1140	0.1158	0.1417	0.0984	0.1415	0.09038
Kurtosis	7.8571	7.4188	10.7313	8.1141	8.9764	10.1098	7.79064
Skewness	0.2029	0.1553	0.0344	0.2516	0.0178	-0.1870	0.04157
Jarque Bera	3296.1	2722.6	8294.1	3664	4956	7033.2	3185.3

Les résultats du test Lagrange Multiplicateur (LM test)d'effet ARCH, tableau(2), rejettent l'hypothèse nulle d'homoscédasticité en faveur de l'hypothèse alternative d'hétéroscédasticité ce qui signifie qu'il existe un effet ARCH pour toutes les séries de rendement. Ces résultats justifient la nécessité d'utiliser des modèles d'hétéroscédasticité conditionnelle. En outre, les résultats du test Engle et Ng (1993), tableau (2), montrent une présence évidente des effets asymétriques dans les séries des rendements des indices boursiers et de portefeuille. En effet, les résultats du negative size bias test (b_2) montrent que l'asymétrie négative est présente dans la réalité de toutes les séries des rendements. Cependant, les résultats du positive

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size bias test (b_3) ne sont pas significatifs, ce qui signifie que l'hypothèse de l'asymétrie positive n'est pas acceptée. Le test de Fisher confirme l'existence de l'effet de l'asymétrie de la volatilité conditionnelle.

Tableau 2: Test effet ARCH et Test effet asymétrie

	LM Test		Test d'effet asymétrie			
	Stat	P-Value	b_1 (t-stat)	b_2 (t-stat)	b_3 (t-stat)	F-stat
CAC	537.2	0.0000	3.0492	-3.7301	0.9277	54.057
DAX	633.2	0.0000	4.1446	-4.6706	0.7961	57.065
SPX	916.2	0.0000	3.0911	-5.5602	1.2847	60.658
CCMP	617.2	0.0000	4.0306	-4.6473	1.4080	69.127
UKX	733.3	0.0000	2.5350	-4.4615	2.3159	76.277
NKY	954.2	0.0000	0.8466	-3.0429	1.2444	23.890
Equity Index PF	823.2	0.0000	3.8210	-3.6809	0.7867	52.860

Note: Résultats du test de Engle & Ng (1993). Pour les b_i, on rejette l'hypothèse nulle de l'absence d'effet asymétrique si t-stat > 1.96 (en valeur absolue) et pour F-Stat on regarde la significativité de la statistique de Fisher.

- Les quatre tests proposés par Engle et Ng (1993) sont les suivants:

Sign bias test (b_1): $\hat{\varepsilon}_t^2 = a_1 + b_1 S_{t-1}^- + e_t$

Negative size bias test(b_2): $\hat{\varepsilon}_t^2 = a_2 + b_2 S_{t-1}^- \hat{\varepsilon}_{t-1} + e_t$

Positive size bias test(b_3): $\hat{\varepsilon}_t^2 = a_3 + b_3 S_{t-1}^+ \hat{\varepsilon}_{t-1} + e_t$

Joint test (F-stat): $\hat{\varepsilon}_t^2 = a_3 + c_1 S_{t-1}^- + c_2 S_{t-1}^- \hat{\varepsilon}_{t-1} + c_3 S_{t-1}^+ \hat{\varepsilon}_t + e_t$

Sur la base de ces résultats, nous déduisons qu'il est indispensable de prendre en compte les faits stylisés des séries de rendementsdans l'évaluation de la VaR et l'ES du marché en tenant compte des modèles dynamiques de la volatilité et de la corrélation.

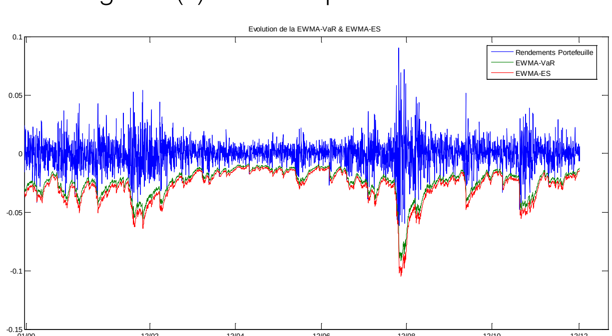
b) Résultats empiriques et discussion

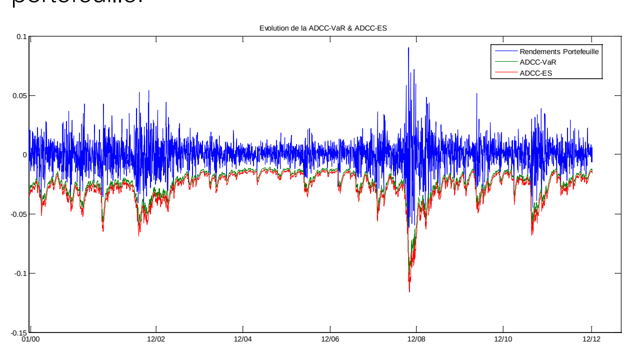
Lesrésultatsd' estimation des paramètres des modèlesprésentés dans le tableau (3) montrent unepersistance dans l'évolution de lamatrice variance-covariance et de la corrélation des indices boursiers. En effet, plus le paramètre (β) qui mesure le degré d'inertie est proche de 1, plus les effets des chocs persistent dans l'évolution de la corrélation.Nous constatons que α+β est assez proche de 1 ce qui montre que la volatility clustering et le caractère leptokurtique des distributions empiriques des rendements du portefeuille sont des phénomènes omniprésents. En outre, le coefficient d'asymétrie γ du modèle ADCC-TGARCH est positif, ce qui signifie que la corrélation augmente plus en réaction à la baisse des marchés qu'à la hausse.

Tableau 3: Résultats d'estimation des paramètres des modèles

Paramètres	ADCC (1,1,1)	DCC (1.1)	EWMA
α	0.0144	0.0162	0.06
β	0.9710	0.9785	0.94
γ	0.0122		

En appuyant sur les paramètres estimés ci-dessus, nous calculons la VaR et ES du portefeuille. Dans la figure (2) sont reportées les évolutions respectives des prévisions de la VaR et de l'ES journalière à 99% comparés aux rendements réels de portefeuille.





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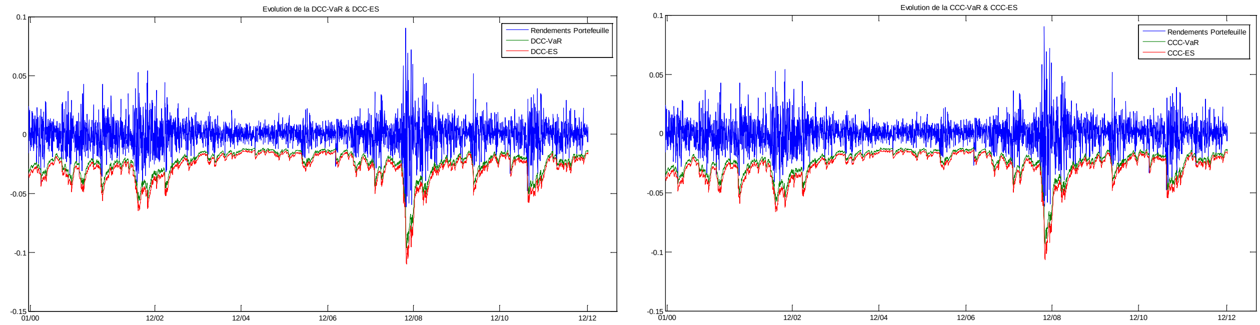

Figure 2: P&L, VaR et ES du portefeuille

Pour tester la fiabilité des mesures du risque de marché estimées, nous utilisons les méthodes de backesting présentées ci-dessustelles que TL test, POF et TUFF Tests de Kupiec et CCI et CC tests de Christoffersen. Nous testons la qualité prédictive des modèles sur une fenêtre de temps de 250 jours ouvrables représentantla période 2007-2008.Période caractérisée par la crise de subprime où la volatilité des marchés financiers a enregistré un record historique jamais vu(le VIX et le V2X ont réalisé un record historique de plus de 80%), ainsi que sur une fenêtre de 750 jours ouvrables représentantla période début 2010-fin 2012. Période caractérisée par la crisedes dettes souveraines en Europe.Chaque modèle de risque est calculé pour troisniveaux de risque: 95%, 97.5% et 99%.

Les résultats de TL test, présentés dans les tableaux (4.1, 4.2 et 4.3), montrent que tous les modèles de mesure de la VaRà 99% fournissent un nombre d'exceptions qui fait partie des zones de validation du modèle interne, soit de yellow zone ou de green zone, avec une nette surperformance du modèle ADCC-VaR qui affiche un nombre réduit des violationsde la VaR, 5 pour T=250 et 17 pour T=750, ce qui signifie que ce modèle encaisse bien le choc de volatilité de marché surtout en période des crises par rapport aux autres modèles de VaR.L'unique exception sont les modèles EWMA-VaR et CCC-VaRau seuil de 99% pour une période dubacktest de 750 jours ouvrables qui sont rejetés par le TL test puisqu'elles font partie de la zone rouge, de point de vue du régulateur, les modèles est rejeté et l'institution financière devrait revoir son modèle d'évaluation du risque ou utiliser l'approche standard de calcul des fonds propres exigés pour couvrir le risque de marché.

Tableau 4.1: Résultats des Traffic Light Test pour VaR à 99%

	TL test		Failures		Prob	
	250	750	250	750	250	750
EWMA VaR	Yellow	Red	9	22	0.99975	1
CCC VaR	Yellow	Red	8	20	0.99894	0.99997
DCC VaR	Yellow	Yellow	8	18	0.99894	0.99972
ADCC VaR	Yellow	Yellow	5	17	0.95882	0.99926

Tableau 4.2: Résultats des Traffic Light Test pour VaR à 97.5%

	TL test		Failures		Prob	
	250	750	250	750	250	750
EWMA VaR	Yellow	Yellow	14	29	0.99823	0.9908
CCC VaR	Yellow	Yellow	13	31	0.99544	0.99707
DCC VaR	Yellow	Yellow	13	29	0.99544	0.9908
ADCC VaR	Yellow	Yellow	12	29	0.989	0.9908

Tableau 4.3: Résultats des Traffic Light Test pour VaR à 95%

	TL test		Failures		Prob	
	250	750	250	750	250	750
EWMA VaR	Yellow	Green	22	39	0.99611	0.63956
CCC VaR	Yellow	Green	18	42	0.95264	0.80111

DCC VaR	Yellow	Green	18	38	0.95264	0.5761
ADCC VaR	Yellow	Green	18	40	0.95264	0.69893

Les résultats du POF tests obtenus dans les tableaux (5.1, 5.2 et 5.3) sont différents des résultats de TL test. Ils montrent que seul l'emploi du modèle ADCC-VaR est validé. La statistique calculée duPOF tests est inférieureà la valeur critique de 3.842au seuil de 5% et 6.63 au seuil de 1% de seuil de tolérance ce qui signifie que la qualité prédictive du modèleADCC-VaRest bien vérifiée. Les autres modèles affichentde mauvais résultats, car la valeur critique au seuil de 5% et même au seuil de 1%étaitdépassée, ce qui met en évidencel'importance du choc de la volatilité sur le marché des actions.Pour le niveau de VaR à 97.5%, nous constatons que la validité de la qualité prédictive des mesures VaR n'est pas acceptée,quel quesoit le modèle du risque considéré. Toutes les statistiques calculées duPOF testsont supérieures à la valeur critique, ce qui signifie que la qualité prédictivedes modèles n'est pas vérifiée.En revanche, le test TUFF est accepté pratiquement pour tous des modèles de VaR au seuil de 5% et 1%.Il est important de prendre en considération quand le premier dépassement de la VaR a eu lieu. Néanmoins, le test TUFF seul n'est pas un indicateurde robustesse pour évaluer la qualité du modèle de VaR.

Par conséquent, en s'appuyant sur les résultats des POF tests et test TUFF, il semble que le modèle ADCC-VaR est le plus adapté pourrefléter le risque réel en cas de conditions extrêmes des marchés par rapport aux autresmodèles.En effet, la période de baktesting choisie pour le cas de T=250 représente la période la plus stressante del'histoire du capitalisme où la volatilité des marchés financiers a marqué des recordshistoriques jamais vus. Il est clair que dans ce type de conjoncture de marché, lesmodèles trouvent quelques difficultés à capturer tous les mouvements des marchés et malgréça, le modèle ADCC-VaR a montré une forte capacité à capturer les différents mouvementsdes marchés même dans des régimes de volatilité anormale.

Tableau 5.1: Résultats du test de Kupiec pour la VaR à 99%

	LR_{POF}		LR_{TUFF}		First failure	
	250	750	250	750	250	750
EWMA VaR	10.229	18.635	5.4315	6.4579	3	2
CCC VaR	7.7336	14.445	5.4315	6.4579	3	2
DCC VaR	7.7336	10.666	5.4315	6.4579	3	2
ADCC VaR	1.9568**	8.9446	3.5893**	6.4579	7	2

Tableau 5.2: Résultats du test de Kupiec pour la VaR à 97.5%

	LR_{POF}		LR_{TUFF}		First failure	
	250	750	250	750	250	750
EWMA VaR	7.3304	4.9383	3.6599	4.6558	3	2
CCC VaR	5.7302	6.8796	3.6599	4.6558	3	2
DCC VaR	5.7302	4.9383	3.6599	4.6558	3	2
ADCC VaR	4.2925**	4.9383**	3.6599**	4.6558**	3	2

Tableau 5.3: Résultats du test de Kupiec pour la VaR à 95%

	LR_{POF}		LR_{TUFF}		First failure	
	250	750	250	750	250	750
EWMA VaR	6.259	0.062376	2.3776	3.3215	3	2
CCC VaR	2.2555	0.54809	2.3776	3.3215	3	2
DCC VaR	2.2555	0.006988	2.3776	3.3215	3	2
ADCC VaR	2.2555**	0.17186**	2.3776**	3.3215**	3	2

Les résultats du test d'indépendance de couverture conditionnelle (CCI test), présentés dans le tableau (6), pour les différents modèles de mesure du risque de marché etpour tous les échantillons de backtesting indiquent que les violations sontsignificativement indépendantes. En effet, les statistiques LR_{CCI} sont inférieures à la valeur critique et pour un seuil de tolérance de 5% et même au seuil de

1% cela signifie quel'hypothèse de clustering des dépassementsest rejetée et donc le modèle VaR considéré n'est passuffisamment sensible aux mouvements de marché. Les résultats du CCI test montrent une capacité des différents modèles considérés à capturer le regroupement desviolations de la VaRmême en phase de stress des marchés financiers. En revanche, les résultats du test de couverture conditionnelle (CC test) sont plus compatibles avec les résultats obtenus par le POF test. En effet, la plupart des modèles de VaR sont rejetéspar le CC test. Une grande partie des statistiques calculées du LR_{CC} sont supérieuresà la valeur critique de la loi Khi-deux à 5% (5.99) ce qui indique l'inefficacité prédictive des modèles de VaR; l'unique exception est le modèle ADCC-VaR.

Tableau 6.1: Résultats du test de Christoffersen pour la VaR à 99%

	LR_{CCI}		LR_{CC}		Failure	
	250	750	250	750	250	750
EWMA VaR	0.67516	1.9896	10.904	20.625	9	22
CCC VaR	0.53122	0.34543	8.2648	14.79	8	20
DCC VaR	0.53122	0.57865	8.2648	11.245	8	18
ADCC VaR	0.20493	0.78969	2.1617	9.7343	5	17

Tableau 6.2: Résultats du test de Christoffersen pour la VaR à 97.5%

	LR_{CCI}		LR_{CC}		Failure	
	250	750	250	750	250	750
EWMA VaR	1.6691	0.61174	8.9995	5.55	14	29
CCC VaR	1.4329	0.37736	7.1632	7.2569	13	31
DCC VaR	1.4329	0.61174	7.1632	5.55	13	29
ADCC VaR	1.2157	2.406	5.5082	7.3443	12	29

Tableau 6.3: Résultats du test de Christoffersen pour la VaR à 95%

	LR_{CCI}		LR_{CC}		Failure	
	250	750	250	750	250	750
EWMA VaR	4.271	0.45546	10.53	0.51783	22	39
CCC VaR	2.808	0.18407	5.0636	0.73216	18	42
DCC VaR	2.808	0.57495	5.0636	0.58194	18	38
ADCC VaR	2.808	1.4823	5.0636	1.6542	18	40

L'évaluation du risque de marché parl'Expected Shortfall (ES) permet une meilleure prise en charge des faits stylisés des rendements des actifs financiers que la VaR puisqu'on raisonne en termes de la moyenne des quantiles et non pas en termes d'un quantile unique fixe comme la VaR. Ce constat implique que la valeur estimée de l'ES est systématiquement supérieure à la valeur estimée de la VaR ce que donne à l'ES un réelavantage par rapport à la VaR. En effet, les résultats des tests Z_1 et Z_2 du backtesting de l'ExpectedShortfall (ES), reportés dans les tableaux (7.1 et 7.2), montrent une surperformance des modèles d'ES par rapport aux modèles VaR. Le caractère conservateur de la mesure ES combiné avec l'utilisation des modèles de la volatilité multivariés dynamiques ont permet de produire de meilleurs résultats que les mesures VaR présentées ci-dessus. La validité de la qualité prédictive de tous les modèles est acceptée et ceci quel quesoit le niveau du risque considéré (95%, 97.5% et 99%). Toutes les statistiques calculées destests Z_1 et Z_2 de Acerbi et Szekely (2014) sont supérieures à la valeur critique pour un seuil de tolérancede 5% ce qui signifie que la qualité prédictivedes modèles est acceptée. L'utilisation des modèles de la volatilité multivariés produit des mesures robustes de l'ES. En revanche, le fait que les statistiques destests Z_1 et Z_2 valident toutes les mesures du risque utilisées, nous nous interrogeons sur le faite que les modèles d'ES adoptésentraînent une surestimation du risque du marché en période de stress des marchés financiers.

Enfin, nous constatons que la procédure du backtesting recommandée par le régulateur dans le cadre de FRTB, basée sur l'utilisation de la VaR et non pas sur l'utilisation de l'ES, pénalise la mesure du risque recommandé par FRTB puisque les procédures de backesting de la VaR et l'ES adoptés dans notre étude empirique affichent des résultats très différents.

Tableau 7.1: Résultats du test Z_1 pour Expected Shortfall pour T=250 et T=750

	ES 95%		ES 97.5%		ES 99%	
	250	750	250	750	250	750
EWMA VaR	-0.07858 (-32.438)	-0.18635 (-45.451)	-0.071474 (-28.651)	-0.13943 (-40.111)	-0.031892 (-25.065)	-0.057719 (-35.086)
CCC VaR	-0.12186 (-32.352)	-0.14755 (-45.837)	-0.072687 (-28.614)	-0.10207 (-40.502)	-0.047535 (-25.103)	-0.047778 (-35.481)
DCC VaR	-0.11478 (-32.404)	-0.14426 (-44.486)	-0.067943 (-28.509)	-0.08419 (-39.199)	-0.040087 (-25.057)	-0.032349 (-34.279)
ADCC VaR	-0.073021 (-32.218)	-0.12119 (-47.187)	-0.045749 (-28.456)	-0.07025 (-41.608)	-0.055153 (-24.92)	-0.035417 (-36.512)

Tableau 7.2: Résultats du test Z_2 pour Expected Shortfall pour T=250 et T=750

	ES 95%		ES 97.5%		ES 99%	
	250	750	250	750	250	750
EWMA VaR	-0.8983 (-336.86)	-0.2338 (-466.25)	-1.4001 (-594.06)	-0.76231 (-826.07)	-2.7148 (-1305.5)	-2.1026 (-1807.9)
CCC VaR	-0.61547 (-337.94)	-0.28525 (-472.23)	-1.2312 (-595.64)	-0.82208 (-834.86)	-2.3521 (-1309.3)	-1.7941 (-1830.9)
DCC VaR	-0.60529 (-337.01)	-0.15951 (-457.87)	-1.2213 (-594.07)	-0.67688 (-807.36)	-2.3283 (-1303.6)	-1.4776 (-1768.7)
ADCC VaR	-0.54515 (-335.98)	-0.19594 (-485.01)	-1.0078 (-591.17)	-0.65532 (-855.46)	-1.1103 (-1302.1)	-1.3469 (-1881.2)

Note: les tableaux montrent les valeurs statistiques des tests Z_1 et Z_2 de Acerbi et Szekely (2014) et leur critical-value respective entre parenthèses.

V. Conclusion

Ce travail nous a permis de mettre en évidence, de point de vue théorique et empirique, l'importance d'utiliser les méthodes Value-at-Risk (VaR) et Expected Shortfall (ES) dans l'évaluation du risque bancaire en vue d'examiner leurs performances prédictives.

Dans un premier temps, à travers une étude empirique sur des données réellesetunepériode de tempsqui prend en considérationla crise des subprimes 2007-2008 et la crise des dettes souveraines 2009-2012, nous avons montré que des phénomènes tels que volatility clustering, caractère leptokurtique, excès de kurtosis et asymétrie de la volatilité des distributions empiriques des rendements, sont des phenomena somniprésents dans la réalité du mouvement des marchés financiers. Afin de prendre en considération ces phénomènes dans l'évaluation de la VaR et ES, nous avons utilisésdes modèles de volatilité multivariéstels que les modèles EWMA, CCC, DCC et ADCC. Les résultats obtenus montrent une capacité des modèles VaR et ES estimés à capturer les différentes caractéristiques empiriques et statistiques observées dans l'évolutiondes marchés financiers. En effet, nous avons montréune grande capacité de ces modèles à s'adapter plus rapidement aux changements des conditions des marchés. En revanche, nous avonsconstaté que certaines spécifications montrent plus devariations que d'autres en termes d'encaissement des chocs des marchés, en particulier leschocs négatifs.Cette intuition afait l'objet d'une vérification empirique par une procédure de backtesting de la VaR et de l'ES.L'ensemble de ces procédures nous a permis de tester l'aptitude des modèlesVaR et ESà quantifier correctement les pertes maximales potentielles.

En mettant en place des procédures de backtesting, les résultats obtenus montrent que l'évaluation du risque de marché par l'Expected Shortfall (ES) permet une meilleure prise en charge des faits stylisés des marchés financiers que la VaR. Ce constat implique que les valeurs estimées de l'Expected Shortfall sont systématiquement supérieuresaux valeurs estiméespar la VaR ce que donne à l'Expected Shortfall un réelavantage par rapport à la VaR. En effet, les résultats du backtesting de l'Expected Shortfall (ES) montrent une surperformance des modèles l'Expected Shortfall par rapport aux modèles VaR. Le caractère conservateur de la mesure Expected Shortfall combiné avec l'utilisation des modèles de la volatilité multivariés dynamiques ont permet de produire des meilleurs résultats que les mesures VaR.L'utilisation des modèles de la volatilité multivariés produit des mesures de robustes de l'Expected Shortfall.

Un autre résultat important dégagé est celui de la non-compatibilité de la méthode de backtesting imposée par le régulateur avec la méthode d'évaluation du risque de marché. En effet, nous avonsconstaté que la procédure du backtesting recommandée par le régulateur dans le cadre FRTB, basée sur l'utilisation de la VaR pénalise la mesure du risque recommandé (l'Expected Shortfall).

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Dividend Payout by Defensive Stocks in India in the Pre and Post Covid 19 Period

By Kiran Dandagi, Shweta Madalli & Dr. Prasad Kulkarni

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Methodology: Authors have used descriptive research and observation techniques. The data gathered were analysed using IBM SPSS 26. further, researchers adopted multiple regression and canonical correlation techniques to study the dividend payout impact on defensive stock profitability.

Findings: Researchers found that there is no impact or relationships between dividend payout and profit in the pre and post pandemic period in the defensive stocks.

Conclusions: Dividend payout is strategic and does not depend on profitability of the firm.

Limitations: The research considered Pharmaceuticals and FMCG companies as defensive stocks.

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I. Introduction

The lockdowns during the COVID-19 had an unprecedented effect on economies all over the world. Despite being a worldwide phenomenon, the economic slowdown had a different impact depending on the pandemic exposure and characteristics of each individual country. Even before official predictions of the economic impact were available, the global financial markets crashed in the early months of 2020. The intensity of the financial crisis and investors' responses varied across markets.

As their name implies, defensive stocks shield both investors and the economy during a crisis. When the market is unstable or bad, it is a good idea to invest in defensive stocks to preserve value. These stocks can also be trusted when the market is correcting. These industries are timeless, and essential consumption hardly ever changes. Despite a decline during the first stage of the lockdown, essential consumer goods and medicines are necessary for maintaining human life. Defensive stocks maintained their value even though the markets sell-off rally during Novel COVID-19 did not benefit banks, NBFCs, or the auto industry. Investors are drawn to the FMCG industry because the products are in demand all year long.

The fourth-largest sector of the Indian economy is fast-moving consumer goods (FMCG), with household and personal care products making up half of its sales. The retail FMCG market in India is projected to grow from USD 840 billion in 2017 to USD 1.1 trillion by 2020, with modern trade expected to grow at a rate of 20% to 25% annually, which is likely to increase FMCG companies profits. More than half of the global demand for pharmaceuticals is met by the Indian market. A 9.8% year-over-year increase from Rs 1.29 trillion (USD 18.12 billion) in 2018 brought India's domestic pharmaceutical market turnover to Rs 1.4 trillion (USD 20.03 billion) in 2019.

A dividend is a portion of profits and retained earnings that a company distributes to its shareholders. When a business makes a profit and builds up retained earnings, those funds can either be invested back into the company or distributed as a dividend to shareholders. Dividend yield is calculated by dividing the annual dividend per share by the share price. A defensive stock is one that consistently pays dividends and generates steady earnings regardless of the state of the overall stock market. Defensive stocks typically exhibit greater stability throughout the various stages of the business cycle because there is a constant demand for their products. Consumer staples are goods that people frequently purchase out of necessity regardless of the state of the economy, and companies that produce or distribute them are typically viewed as defensive. They consist of food, drinks, personal care items, tobacco, and a few home furnishings. These businesses produce consistent cash flow and predictable profits in both strong and weak economies. Their stocks typically outperform consumer cyclical or non-defensive stocks that sell discretionary goods in weak economies while underperforming them in strong ones. Major companies of pharmaceuticals and medical equipment have historically been regarded as defensive stocks. There will always be sick people who need care, after all. However, they aren't as defensive as they once were due to rising competition from new drugs and uncertainty surrounding regulations.

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II. Dividends Pay out of pre Pandemic

If a shareholder buys stocks prior to the ex-dividend date, which is the cut off for receiving a company's subsequent dividend, and holds the investment for 60 days or more, dividends can be considered qualified dividends. Qualified dividends are taxed at a rate that is lower than the tax on earned income, ranging from 5 percent for low-income earners to 15 percent for those in the highest tax bracket. That doesn't mean unpleasant surprises can't happen with these trustworthy investment tools. A stock may pay dividends, but that doesn't guarantee that the shares won't lose value over time, possibly losing more than the dividends paid to investors. Additionally, companies have the right to reduce or stop paying dividends, as Kraft Heinz and Century Link did earlier this year. The tax bill passed in late 2017 gave a boost to both dividends and share buybacks. Wealth managers predict dividend pay-outs will likely remain at this level in 2019 barring a recession. In a share buyback, the company issuing the stock pays shareholders the market price per share and reabsorbs the ownership that was previously split between public and private investors. From a financial standpoint, buybacks benefit investors because they increase the value of the shares that are still in circulation. Although increased dividends and corporate buybacks have generously rewarded shareholders, some people are critical of the overall outcome because worker wages have not increased while businesses are handing out billions to investors. Dividend pay-outs must rise, according to Ben Greenfield, a partner and chief investment officer at Waldron Private Wealth in Bridgeville, to remain competitive with rising bond and cash yields. Even though bond yields are still low, according to him, they are rising. According to him; the S&P 500's dividend yield in 2018 was 2.3 percent as opposed to its 25-year historical average of 2 percent. In 2019, he predicted, "dividends should remain constant, but the growth rate will probably slow."

III. Dividends Pay-outs of Post Pandemic

This year, dividends are anticipated to increase to $1.39 trillion, up slightly from the previous forecast due to a stronger than anticipated recovery in company pay-outs. Its most recent estimate, which increased 2.2 percentage points from a previous one, is only 3% below the pre-pandemic peak. In the middle of the COVID crisis, dividend payments, which are made by companies to their shareholders, fell last year as a result of regulatory burdens and government pressure to limit pay-outs. With headline growth at 26.3 percent in the second quarter, however, data from the investment manager's Global Dividend Index indicated that a robust recovery is currently underway. The underlying growth rate, which was 11.2 percent, was adjusted for special dividends, currency fluctuations, timing effects, and index changes. Year over year, growth in 2021 is predicted to be 10.7 percent, which would represent an underlying recovery of 8.5 percent. According to the report, $33.3 billion in dividends from businesses that were restarting payments were responsible for three-quarters of the second quarter's underlying growth. Global dividends as a whole will probably return to their pre-pandemic levels within the next 12 months, according to Jane Shoemake, client portfolio manager for Janus Henderson's global equity income team. As long as policymakers continue to give the economy fiscal and monetary support, the current recovery "will not be hampered by a weak banking system as it was after the global financial crisis a decade ago," she added. Lenders were responsible for half of the decline in global pay-outs in 2020, making limits on bank dividends a significant factor. However, restrictions have been easing in recent years. Billion-euro payments to shareholders were announced by European banks at the beginning of August. Banks in the European Union have benefited from the region's banking watchdog's strong performance in stress tests. Following the Bank of England's mid-July removal of the last of its pandemic curbs, HSBC was one of the U.K. banks to resume dividend payments indicating higher pay-outs in the future. After a wave of cancellations and suspensions the previous year, Europe is staging a strong comeback. Companies continued paying out during the first year of the pandemic in both the United States and Canada, according to the Janus Henderson report. Booming commodity prices increased mining companies' pay-outs, and the report also showed that industrials and consumer discretionary were rebounding strongly. Telecommunications, food, food retail, household goods, tobacco, and pharmaceuticals all experienced defensive industries' typical low single-digit growth rates.

IV. Literature Review

Dividends are ratio extracted from firms profit and shared among shareholders (Robiyanto, R., & Yunitaria, F., 2022). These dividends are provided on interim bases or one time settlement. The dividend has a significant influence on the investment, However, one of the research authors did not find any relationships (Yuningsih, Y., et. al, 2019). Further, it was argued that dividends depend on external equity. The size of the firm is having significant influence on the dividend payouts (Mahfudz, A., & Wijayanto, A. 2020). However, it was observed that in defensive stocks the above phenomena is in the reverse direction.

The importance of customer preference in FMCG purchasing decisions is growing. Customers are developing their own preferences for the final decision-making in the massive FMCG market, influenced by a variety of factors. (Singh, P. K. (2020). Increased market share, customer acquisition, and market sustainability are common objectives in the dynamic low involvement product market. to examine the impact of the following variables on the Price Earnings Ratio (PER) for consumer goods: Current Ratio, Net Profit Margin, Debt to Equity Ratio, Firm Size, and Return On Equity (ROE). The Price Earnings Ratio was significantly impacted by the Return on Equity (ROE), Current Ratio, and Debt to Equity Ratio. While Firm Size does not significantly affect Price Earnings Ratio, it does have a small impact. (Fadjar, A., Jumana, Y. L., & Gunawan, B. (2021)) Because of the simultaneous effects of Return on Equity (ROE), Current Ratio, Debt to Equity Ratio, and Firm Size, price earnings ratio (PER) on consumer goods is significantly impacted.

One of the most challenging parts of finance is dividend policy. With regard to the Fast-Moving Consumer Goods (FMCG) sectors of businesses listed on the NSE, the current study focuses on the factors that influence dividend policy. (Pandey, N. S., Mansuri, B. B., & Ashvini, N. (2017).). The value relevance of significant corporate financial variables using a pricing level-based methodology in the context of Indian FMCG companies. The degree to which fundamentals in Indian FMCG companies support stock values. (Dawar, V. (2012) The support ensures the dividend's value relevance and investing strategy that suggests dividend distributions of earnings have a larger impact confirming the signalling effect of the dividend policy, than does earnings maintained inside the company. The General Meeting of Shareholders has approved the dividend distribution, which typically occurs at the conclusion of each financial reporting year (RUPS): (Hardianto, M. B. S. (2021)) However, the agreement on the sale and a few other things are optional, including the distribution of business dividends. With a variety of enterprises, including those in food, beverages, grains, cosmetics, and other FMCG products, India's economy is experiencing substantial expansion in this area. (Mahajan, Y. (2020)) The effects of the coronavirus epidemic on India's FMCG industry and consumer behaviour The study discovered that the coronavirus pandemic has a significant impact on the FMCG industry and has had an impact on employment in India.

A firm uses a dividend policy to determine how much it will distribute to shareholders in the form of dividends. A corporation often keeps a portion of its earnings while paying out a dividend on the remainder. (SETIAWAN, C., & VIVIEN, V. (2021)) Profitability and firm size among the five independent variables tested show a significant impact on the firm's propensity to pay dividends as well as the dividend pay-out ratio, while the capital structure and the choice of investment opportunities show a statistically significant impact on the dividend payout ratio and the dividend-paying decision.

The company value of the items is greatly impacted both separately and together by the funding decision, profitability ratio, and dividend policy. (Sahid, D. N., & Zulifiati, L. (2019).) Debt to Equity Ratio (DER), Return on Equity (ROE), and Dividend Payout Ratio are used to illustrate decisions, profitability, and dividend policy, respectively (DPR). use the purposive sampling approach.

The connection and effectiveness of Indian FMCG Companies working capital management techniques. Working capital management and profitability have a markedly positive and negative relationship. (Mansuri, B. B., Pandey, N. S., & Ashvini, N. (2017)) Effective working capital management for FMCG companies not only positively correlates with profitability but also has a major impact on it.

The COVID-19 pandemic caused multiple firms to experience supply chain disruptions as a result of the disruptions spreading both forward and backward in the global supply chain networks, highlighting the significance of enhancing resilience in the supply chain networks. (Madhavi, B. R. H., & Wickramarachchi, R. 2021, September).

Under the pandemic stress, the dividend announcements had no effect on stock prices. Even though the dividend increases over the previous year were made during the pandemic time, the announcements made during the pre-pandemic period had a substantial impact on stock returns. (Pandey, D. K., & Kumari, V. 2021). The pre-pandemic results are consistent with earlier noteworthy returns for dividends that were steady, increased, and decreased.

The Covid-19 Pandemic had a negative effect on the corporation since the ratio fell between the time of the pandemic (2020) and before the pandemic, indicating that the company's liabilities were less than its assets and equity. (Nasrullah, N., & Saputri, L. 2021) Profitability metrics such as Return on Assets, Return on Equity, and Net Profit Margin indicate that the Covid-19 Pandemic is detrimental to financial performance.

One of the important decisions involving a company's financial strategy is the decision about dividend payout, which is not made alone. Instead, it is a choice made after telling many considerations. (Jana, D) The dividend policy of a company is influenced by a number of things. Dividend policy determines how the profit will be distributed, and management must select whether to reinvest earnings after taxes or give dividends to shareholders.

The Indian Finance Act 2020's repeal of the dividend distribution tax and its effects on corporate dividend behaviour in India. It looks at what determines dividend pay-outs, what factors influence altering pay out decisions, how regular dividend payers behave, and how common these factors are. (Agrawal, A. 2021).

With significant reductions in pay-outs and omissions demonstrated by regular and irregular payers in 2020 and 2021 relative to the preceding years, COVID's impact on the firm's financial performance and sentiments appears to predominate, suppressing investors' expectations of enhanced pay-outs associated with dividend distribution tax advantages.

In an effort to slow the spread of the pandemic, many nations have implemented pandemic suppression measures like lockdowns and community quarantines. Research and development on COVID-19 vaccines and antivirals have increased in response to these dire forecasts. (Yu, D. E. C., Razon, L. F., & Tan, R. R. (2020). SOLIDARITY may be able to provide remedies to the pandemic considerably more quickly than usual by avoiding several regulatory barriers that arise in the launch of novel pharmaceuticals because these pharmaceutical items are currently available on the market for the treatment of other diseases.

A terrible viral sickness called COVID-19 has evolved into an economic crisis that has had far-reaching and protracted effects on international markets. For a very long time, investors have been hearing about COVID-19 and its effects in various parts of the world. (Eachempati, P., Srivastava, P. R., & Panigrahi, P. K. (2021)). Although COVID19 impacts first appeared in Wuhan, China, in December 2019, the global markets did not react immediately until the World Health Organization formally labelled the COVID19 epidemic a global pandemic on March 11, 2020. Due to these multi-channel incidents, investor confidence has plummeted, wrecking the world stock markets. Governments had to move rapidly to safeguard their populations from the COVID-19 epidemic, which abruptly changed our lives in terms of both health and economy. (Gilbert, C., & Guénin, H. (2022)). One of the factors of marketing that is most obvious is publicity. Public relations professionals appear to rely on the idea that, when two messages are comparable in content, news in the media has a higher value than advertising. (Verčič, T., Verčič, D., &Laco, K. (2008)). to determine the interaction of communication impacts between news editorials and advertising. It is obvious how the findings of this might have potentially significant consequences for both advertising and public relations experts given that public relations specialists contend that editorials are more credible and have a higher influence than advertising.

The COVID-19 epidemic has had a significant negative impact on business. The normal operations of the company were impacted by the lockdowns. Manufacturing facilities were closed. Everything except necessities and medical supplies was stopped. Movement was limited. The economy was significantly impacted by this. The business houses gradually returning to normal activities marked the beginning of the unlocking. (Gogoi, B. J. (2021)). The epidemic caused numerous modifications in how businesses operate. During the pandemic, the digital method rose to prominence and has since experienced rapid expansion. To adapt to the needs of consumers in the shifting environment, brands underwent operational and strategic reforms. The healthcare zone is on the epicenter of this unheard of international pandemic challenge and the pandemic is possibly to price massively to the fitness zone. Healthcare enterprise has been witnessing a lack of commercial enterprise and this fashion is anticipated to preserve for the foreseeable destiny and the reality that the sector's prices are predominantly (around 80%) fixed, it's miles anticipated that there will be losses & serve effect on coins flows. (Chandrakant, V. L) The national lockdown was imposed in India following the novel coronavirus pandemic. In this paper, I talk India's Health care machine in the duration of COVID-19, makes a speciality of demanding situations confronted by way of means of healthcare enterprise because of duration of COVID-19, effect of COVID-19 on Healthcare Industry in India & Know to put of Healthcare enterprise after COVID-19 & advise conclusion.

The long-time period repercussions and consequences of Covid-19 on India as an economic system. India's GDP has decelerated to its lowest in over six years and the outbreak of coronavirus has posed clean demanding situations for the worldwide economic system. Even earlier than the onset of this pandemic, the worldwide economic system became confronting turbulence due to disruptions in change that go with the drift and attenuated growth. (Shingare, A. D., & Kanoi, T. (2020). The scenario has now worsened with the aid of using the demand, delivery and liquidity shocks that covid-19 has inflicted. Covid-19 is probably to result in a new normal. Being aware about and getting ready for those dynamic shifts will assist corporations and economies navigate within side the submit Covid-19 world. This examination offers a few insights at the effect on the economic system of the pandemic.

V. Research Methodology

Researchers conducted exploratory research using the capital line database of Indian companies. This qualitative research imported data of dividend and gross profit of FMCG and Pharmaceutical industry. Further, researchers selected 20 companies in FMCG and 20 pharmaceutical companies on convenience methods during May 2022 to June 10 2022. The database data extracted for years to understand the pre and post period of the pandemic. Added to this data was cleaned and prepared for data analysis. Researchers used Multivariate techniqu based on general linear models and found relationships with canonical relationships.

VI. Discussions

Researchers collected 20 companies' dividends and profits for 5 years in the defensive stocks. The list is populated in Table 1.

Table 1: Descriptive statistics of the research

	2017		2018		2019		2020		2021	
Companies	Dividend	Gross profit	Dividend	Gross profit	Dividend	Gross profit	Dividend	Gross profit	Dividend	Gross profit
Emami ltd	39.72	726.58	158.88	694.54	0	714.54	181.57	663.96	355.61	935.36
Dabur india ltd	220.19	1,369.78	220.19	1,475.63	220.79	1,612.18	247.39	1,538.40	309.3	1,826.71
Marico Ltd	451.59	1,205.82	548.58	1,021.00	613	1,287.00	872	1,374.00	968	1,418.00
Bajaj Consumer Care Ltd	169.63	285.64	177	281.84	206.5	294.85	0	236.22	0	276.72
Patanjali Ayurved Ltd	0	1,632.29	278.92	602.49	0	641.15	0	764	0	811.81
Asian Paints Ltd	987.97	2952.15	834.5	3,176.94	0	3,711.02	0	4,103.00	321.33	4,787.85
Godrej Consumer Products Ltd	195.78	1,163.85	681.33	1,352.31	1,226.52	1,542.15	0	1,481.00	0	1,677.30
Jyothy Labs Ltd	109.01	220.7	18.19	265.07	0	285.79	110.16	241.32	0	301.32
Zydus Wellness Ltd	25.4	112.49	31.26	137.63	0	99.77	0	-51.99	0	-184.64
Pidilite Industries Ltd	243.52	1,234.96	304.69	1,422.76	0	1,476.28	355.61	1,562.74	0	1,603.73
Bajaj Consumer Care Ltd	169.63	285.64	177	281.84	206.5	294.85	0	236.22	0	276.72
Marico	451.59	1,205.82	548.58	1,021.00	613	1,287.00	872	1,374.00	968	1,418.00
Colgate-Palmolive (India) Ltd	271.99	984.67	652.77	1,139.54	707.16	1,301.72	543.97	1,241.30	1,468.72	1,532.72
Nestle India Ltd	829.18	2,181.55	867.74	2,764.62	2,709.28	3,043.64	1,301.61	3,183.17	1,301.61	3,273.96
Gillette india ltd	534.4	412.67	74.94	386.89	61.91	386.75	0	365.02	270.46	486.98
Tata Consumer Products Ltd	148	409.89	155.44	750.67	0	607.6	0	844.23	0	962.35
Heritage Foods Ltd	9.28	330.61	9.28	125.06	0	172.4	0	-96.64	0	240.24
Johnson & Johnson Pvt Ltd	650.62	1,010.65	135.45	1,089.84	0	1,099.60	0	1,147.51	0	1,569.57
Hatsun Agro Product Ltd	15.22	314.6	60.87	292.32	77.61	361.78	96.25	452.88	129.34	674.06
Amrutanjan Health Care Ltd	3.22	35.83	4.46	35.79	3.22	37.84	6.14	38.81	4.68	85.57

(Source: Primary Data)

Researchers used Multivariate analysis based on a general linear model. Results of impact of profitability on dividend is given in table 2

Table 2: Multivariate analysis of effect of Profit on dividend given by defensive stocks

Effect (Wilks Lambda)	Value	F	Hypothesis df	Error df	Sig.
Intercept	.633	1.161[b]	5.000	10.000	.392
2017 Profit	.866	.309[b]	5.000	10.000	.897
2018 Profit	.623	1.212[b]	5.000	10.000	.371
2019 Profit	.630	1.173[b]	5.000	10.000	.387
2020 Profit	.573	1.487[b]	5.000	10.000	.277
2021 Profit	.345	3.798[b]	5.000	10.000	.035

(Source: Primary data)

In 2017, Dividend distribution based on the profitability had shown no significance (F=0.309, N=5, p>0.05) Similarly, researchers also observed the impact of Profit on dividend in the year 2018 and found no effect(F=1.212, N=5, p>0.05). Further, the data analysis 2019 also has no major effect by profit on dividend distribution (F=0.630, N=5, p>0.05), Added to this, the dividend distribution had not shown any impact in the year 2020 (F=0.277, N=5, p>0.05). This has shown that lock down period also not having a significant influence on the dividend distribution though defensive stocks had made huge profits. However, later the stabilization of the economy and consistent in defensive stock sales had increased profitability and companies began providing dividends. Thus, it shows that post pandemic profitability had an effect on dividends in particular 2021($F=0.345$, $N=5$, $p>0.05$). The data analysis had shown that Profitability pre-pandemic has no significance on dividend however, in the post pandemic defensive stock companies redistributing their wealth.

After understanding the impact of profit on dividend researchers tested the canonical correlation between profitability and dividend. The results show that except in the year 2017 hypothesis had shown significant relationships by omitting other year details.

Table 3: Canonical correlation settings to assess dividend relationship with Profits

Canonical Correlations Settings	
	Values
Set 1 Variables	2017 Dividend, 2018 Dividend, 2019 Dividend, , 2020 Dividend, 2021 Dividend,
Set 2 Variables	2017Profit, 2018 Profit, 2019 Profit, , 2020 Profit, 2021 Profit,
Centered Dataset	None
Scoring Syntax	None
Correlations Used for Scoring	5

(Source: Primary Data)

Table 4: Canonical correlation between profit and dividend in the pandemic era

	Correlation	Eigenvalue	Wilks Statistic	F	NumD.F	Denom D.F.	Sig.
1	.964	13.239	.017	3.058	25.000	38.650	.001
2	.762	1.388	.247	1.241	16.000	34.243	.288
3	.535	.402	.590	.789	9.000	29.355	.628
4	.373	.161	.827	.646	4.000	26.000	.635
5	.198	.041	.961	.569	1.000	14.000	.463

H0 for Wilks test is that the correlations in the current and following rows are zero

The result had shown significance in 2017 wherein ($F=0.17$, $N=5$ $p<0.05$). Thus we can conclude that there is a negligible impact or correlation between dividend and profitability pre and post pandemic.

VII. Conclusions

The Author's effort in finding relationship and impact between Dividend and profitability yielded mixed results. In the Multivariate techniques using wilks test it was found that only 2021 year is influencing dividend payout. The rest years have negative impact as lockdown this might be sure to influence profitability. Similarly, only one had shown their relationship. Thus, we can conclude that there is no impact of dividend and profitability. However, researchers found that further investigation required to strengthen the validity by changing the local coverage to national level and including many more datasets and variables.

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Regulating Frauds in Online Marketplace Lending: A Comparative Study on China and U.S.

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Keywords: online marketplace lending; fraud; platform failure; china.

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Zhen Lei [α], Jing Tao Andy Lin [σ], Ho Kai Chan [ρ] & Ting Rose Dan [ω]

Abstract- Recent platform frauds in the U.S. and other parts of the world raise skepticism about the viability of online marketplace lending (OML), a fast-growing new industry. In China, over one-third of peer-to-peer lending platforms have failed, many involve outright fraud. We find in the U.S., OML platforms profit from loan origination but do not bear borrower credit risk, giving rise to the incentive to overstate borrowers' quality. In China, most OML platforms are "balance sheet lenders" but not subject to the banking regulations. Failure to control borrower credit risk and moral hazard lead to Ponzi Scheme-type platform-runs. Our comparative case study on Lending Club (NYSE: LC) versus Yirendai (NYSE: YRD), and empirical analysis of 735 OML plat-forms in China confirm these observations. We discuss regulatory responses and market-based solutions including leveraging users' social networks in lending.

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I. Introduction

Access to credit plays a fundamental role to economic development. Online marketplace lending (OML) applies data and technology to allow multiple lenders to collectively fund a loan. In this process, the platform company acts as a marketplace, an identification agency, and a match-maker. OML initially emerged as "peer-to-peer" (P2P) marketplace, with platform companies enabling individual investors to provide financing to individual borrowers. As products and business models have evolved, the investor base has expanded to institutional investors and the borrower base has also expanded to small businesses (DOT (US Department of the Treasury) 2005).

The essential selling point advanced by OML is the notion that by eliminating the "middle man" — the often-cumbersome commercial bank—investors can earn higher returns and borrowers can obtain financing at lower costs. However, increasing platform frauds have drawn skepticism in this new business model. In 2014, the NASDAQ listed, Sweden-based P2P company Trust buddy went bankrupt for misusing lenders' capital to finance bad debts. In May 2016, the Lending Club, an OML leader in the US, was found to have altered loan application information so as to sell loans upstream to Wall Street firms. The news caused Lending Cub's stock price to drop more than one-third in one day, and its CEO to step down (Corkery 2016). In the world's largest OML market—China,[i] 1,523 out of the 3,984 platforms (or 38.2%) established since 2010 have failed (Figure 1), with "fraud" cited as the top-ranked reason for platform failure.[ii]

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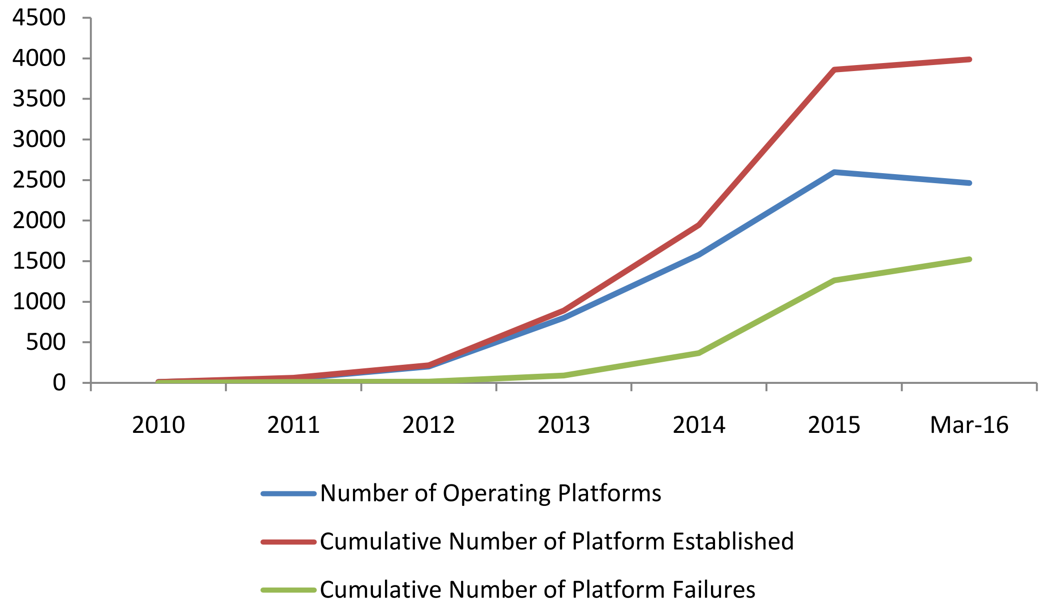

Figure 1: Online Marketplace Lending Platforms in China (2010-March 2016). Note: Data comes from Wangdaizhijia (wdzj.com)

This article asks two questions: (1) what leads to OML platform fraud in the US and China respectively? (2) how regulations and positive innovations should evolve to support the safe growth of OML? Our investigation reveals stark difference in the way OML is practiced in the US and China: Whilst most US platforms are "marketplace lenders" that do not bear borrower credit risk, most Chinese platforms are "balance sheet lenders" (shadow banks) that guarantee loan investors' returns. For marketplace lenders, fraud arises from their loan origination incentives that motivate misstatement in borrowers' quality in order to sell loans to individual and institutional investors. For balance sheet lenders, fraud arises from the misuse of loan investors' capital that mimics "Ponzi Schemes", leading to platform failure. Our empirical evidence of 735 (failed and normal operating) platforms in China confirms this proposition.

We see the need for enhanced transparency as essential to the safe growth of OML industry. Both borrowers and investors rely on platforms to mitigate information asymmetry, while platforms have incentives to exploit their information advantage. Hence, regulations that require greater transparency on all market participants and processes are vital for fraud detection. Though OML platforms increasingly rely on proprietary credit scoring models that use new data sources and complex algorithms, we highlight the need to monitor their transparency. Finally, we evaluate a positive innovation that leverages users' social capital and networks for loan origination and credit risk control in OML.

The rest of this paper proceeds as follows: Section 2 illustrates the origins of frauds in OML and how they lead to platform failure. Section 3 is a comparative case study of Lending Club versus Yirendai, both of which are NYSE-listed and OML market leaders in the US and China respectively. Section 4 presents an empirical analysis of 735 (failed and normal operating) OML platforms in China to shed light on causes of platform failure. Section 5 analyzes the OML regulatory framework in the US and China, and discusses a positive innovation that leverages users' social networks in OML. Section 6 concludes with managerial implications.

II. Adverse Selection in Online Marketplace Lending

Akerlof (1970) shows how adverse selection between sellers and buyers in the used car market leads to market failure. In the credit market, borrowers know more about their capability and willingness to repay loans than lenders. The information asymmetry is magnified in an online environment, where no face-to-face interaction between lenders and borrowers is required. If lenders are unable to distinguish high quality from low quality borrowers, they are only willing to bid at "average" interest rates. This benefits only low quality borrowers, causing high quality borrowers to withdraw. Knowing only low quality borrowers are in the market, risk-averse lenders also withdraw, leading to market failure. This proposition echoes a common perception that OML has become one of the "fringe" credit options for higher-risk borrowers who are increasingly turned away by risk-adverse traditional lending institutions (Chaffee and Rapp 2012).

But OML needs not to be a "lemon's market". The opportunity for OML lies in its potential to extend access to credit to historically underserved market segments, as long as there are credible signals on borrowers' quality. In the US, where the consumer credit system is more developed, OML platforms determine credit risk primarily based on borrowers' FICO score,[iii] supplemented by other sources of "hard" information.[iv]

OML platforms, as core information intermediaries, are responsible for information processing (identification, verification, screening and monitoring) on borrowers' credit risk. In practice, investors in OML cannot see borrowers' FICO scores directly. Instead, they make investment decisions based on the "loan grade" that platforms assign to each borrower. Higher loan grade borrowers attract more biddings and their loans have higher chance of being funded. Loans comprise prime borrowers are also easier to be securitized and sold to institutional investors.

The bulk of business revenue of OML platforms comes from volume-based "transaction fee" for each successful loan origination. Unlike banks, "marketplace lender" platforms do not assume borrower credit risk but can take the upside of more loans facilitated. This creates incentives to overstate borrowers' quality for loan origination. This is a fraud on investors, for loans that do not meet investors' criteria are "packaged" and sold to loan investors. The Lending Club scandal confirms this practice: to sell a $22 million sub-prime loan to a Wall Street investment bank, the Lending Club knowingly altered borrowers' information to make them conform to investor's explicit instructions (Dayen 2016).

The common defense of OML platforms is that they rely on quantitatively complex credit scoring models (CSM) for credit rationing. These models allegedly assign borrower's loan grade based on objective "hard" information such as FICO score. However, a recent report by the US Department of the Treasury on OML expresses skepticism. In its words, "the use of new variables and more complex algorithms in CSM has the potential to create both new opportunities and new risks. The extent to which the benefits will materialize remains uncertain given that limited public research exists on these topics. This is partly because CSM are proprietary and data sources are expensive to construct or not available to outside researchers." (DOT 2016)

Indeed, recent evidences show that bank incentives induced by loan origination can alter the link between FICO score and default rates (Rajan, Seru and Vig 2015). Using a unique dataset from a major European bank, Berg, Puri and Rocholl (2016) show loan officer incentives significantly skew ratings even if the quantitative model is correct and there is no subjectivity in the system. In other words, economic incentives can override complicated quantitative models. This problem is particularly pronounced in countries where reliable hard information on borrower's quality is unavailable and substantial discretion is exercised by "line officers" whose performance is linked to the volume of loans originated.

Other anecdotal evidence reveals that OML platforms do not verify information submitted by borrowers a large portion of time and when they do verify, the information is often inaccurate (Lieber 2011). The direct consequence is borrower delinquency. In case of default, lenders have no direct recourse with the borrower,[v] and have to rely completely on the effort of the platform or their designees for collection, which platforms are notoriously bad at doing.[vi]

III. How OML Platforms Become "Ponzi Schemes"?

Borrower delinquency should have little impact on platform failure as long as the platform is only a "marketplace" that does not assume credit risk, as the case of most US OML platforms. However, in China where the consumer credit system is rudimentary and legal protection for investors is weak, most OML platforms guarantee investors' returns and promise investors' right of withdrawal. These platforms operate like "shadow banks" and holding loans on its balance sheet, but they do not have licenses for lending, nor are they subject to current regulation and supervision that applies to financial institutions.

A typical platform failure starts with borrowers' delinquencies causing losses to investors. Having promised investors certain returns, the platform has to use its own capital to compensate investors. When more delinquencies drain the platform's capital, in order to sustain operation, the platform has to use new investors' funds to pay back existing ones, leading to Ponzi Scheme-like fraud. Even worse, when new investors' funds are insufficient to repay existing ones, any default on existing investors creates panic among others, causing other investors to withdraw their funds. This creates a situation similar to a bank run, causing the platform to fail. For example, the collapse of Beijing-based P2P platform EZubo in 2015 was described by the Wall Street Journal as a "$7.6 billion Ponzi Scheme" that defrauded over 900,000 loan investors.[vii] In 2016, Shanghai-based P2P platform Zhongjin closed down with missing funds of $ 4.6 billion, affecting over 130,000 investors (Ren 2016). Since December 2015, regulatory authorities in Beijing, Shanghai and Guangzhou have suspended registration of any new OML firms and started cracking down fraudulent operators.

It was not uncommon to see that some Chinese OML platforms were created as a sham to defraud loan investors. Fake projects and fake borrowers' information are listed on the platform to attract investors. Loan investors thought their funds are lent to a particular project but in fact they are transferred to accounts of the operator or his affiliated firms, commonly referred to as "self-financing" in OML. In the well-known "Deng Liang and Oriental Ventures" case of 2014,[viii] Deng set up a Shenzhen-based OML platform ("Oriental Ventures"). The platform promised an annual return of 36-45% and attracted over ￥126 million ($ 19.4 million) in funding from investors. Instead of being passed to actual borrowers, the funds were deposited into Deng's personal accounts and used to purchase real estate. Eventually Deng was convicted for violating Article 176 of the Criminal Law of China on "illegal public fund raising" by the Shenzhen-Luohu District Court.[ix] This case is known as the first criminal sanction on Chinese OML platforms.

IV. Lending Club vs. Yirendai: A Comparative Case Study

This section compares two NYSE-listed OML companies to substantiate our arguments: Lending Club (www.lendingclub.com) is the largest OML platform in the US. Yirendai (www.yirendai.com) is one of China's OML market leaders and the first to go public in the US in December 2015.[x] Unless otherwise specified, information on the Lending Club (hereafter "LC") is extracted from its 10-K filing[xi] and information on Yirendai (hereafter "YRD") is extracted from its F-1 filing[xii] and F-20 filing.

YRD and LC have similar mission statement, that is to "make credit more affordable and investing more rewarding". Both companies focus on their domestic market. Each unit of loan investment on YRD is ￥100 ($16.1) and $25 on LC. Both companies' revenue comes from "transaction fees" charged to borrowers and "service fees" charged to loan investors. The transaction fee LC charges its borrowers is equal to 1-6% of loan amount (varies on borrowers' loan grade), and the service fee to lenders is 0.7-1.5% of actual investment return. In comparison, YRD charges much higher fees: 5.6-28.2% for borrowers and 0.2-5.9% for lenders. This fee structure translates into a total cost of borrowing on YRD 16.9-39.5% per annum, much higher than the 14-20% on LC. Loan investors' historical return on YRD averages 6.6-11.25%per annum, lower than the average 11% for LC.

How do the two platforms address the adverse selection problems? LC reported to have the following measures in place: First, its Standard Loan Program (3- or 5-year term loans) are offered only to borrowers with a FICO score of 660 or above.[xiii] LC uses its own proprietary credit scoring model, which as signs loan grade to borrowers based on their FICO score and other consumer information. In its 2014 report, LC reported that it spent $34.7 million in engineering and product development expense to improve the accuracy of its credit scoring and fraud detection system, a 150% increase from 2013. Albeit undeveloped, loan investors can sell their notes issued by LC before maturity through a secondary market operated by an unaffiliated registered broker-dealer.

In comparison, YRD's strategy is to target "prime borrowers, comprising credit card holders with salary income". Information that borrowers need to submit to YRD include copy of PRC identity card, personal and employer contact details, bank account information, credit card number and consent for YRD to request a credit report of the borrower from the People's Bank of China (PBOC).[xiv]The challenge is that there is lack of an integrated individual credit score similar to FICO in China. The PBOC's personal credit system is in its infancy and it is doubtful whether the platform checks individuals' credit reports at all.[xv] Though YRD claims its proprietary credit scoring system also assesses each borrower based on his or her past records on YRD, plus other evidence from public security bureau, courts, and the borrower's E-commerce track records, these are largely ineffective. The reason is that there is no personal bankruptcy law in China, public bodies and private E-Commerce sites maintain their own record system and there is little sharing of data. It is costly, if not impossible, to get an effective picture on a borrower's credit history. Other risk control employed by YRD includes a rule that the same borrower cannot have multiple concurrent loans originated on its platform. This can be ineffective because the same borrower might have outstanding loans on another lending platform, which YRD has no information on. Finally, YRD maintains a secondary market of loans originated on its platform.

One way to test the "fairness" of the loan grade assigned by each platform is to examine the ex post net charge-off rate, calculated as the total charge-off amount divided by the total amount of corresponding loans, for each borrower loan grade. Intuitively, if the credit rationing of the platform is accurate, then the ex post net charge-off rate should increase monotonically from the highest grade to the lowest grade borrowers. Deviations from this pattern would suggest irregularities in credit rationing.

Figure 2 plots the net charge-off rate for loans of different borrower grade on YRD and LC from 2013 to 2015. We see stark differences: while on LC the net charge-off rate increase monotonically from 0.98% for A-grade-borrowers to 14.11% for FG grade-borrowers, the pattern is opposite for YRD. On YRD, A-grade-borrowers have net charge-off rate of 4.35%, significantly higher than all other grade borrowers. This irregularity can be a result of deficiencies in YRD's credit scoring model given the shortage of reliable hard information. But it certainly means many low-quality borrowers that do not deserve A-grade are given A-grade and sold to loan investors.

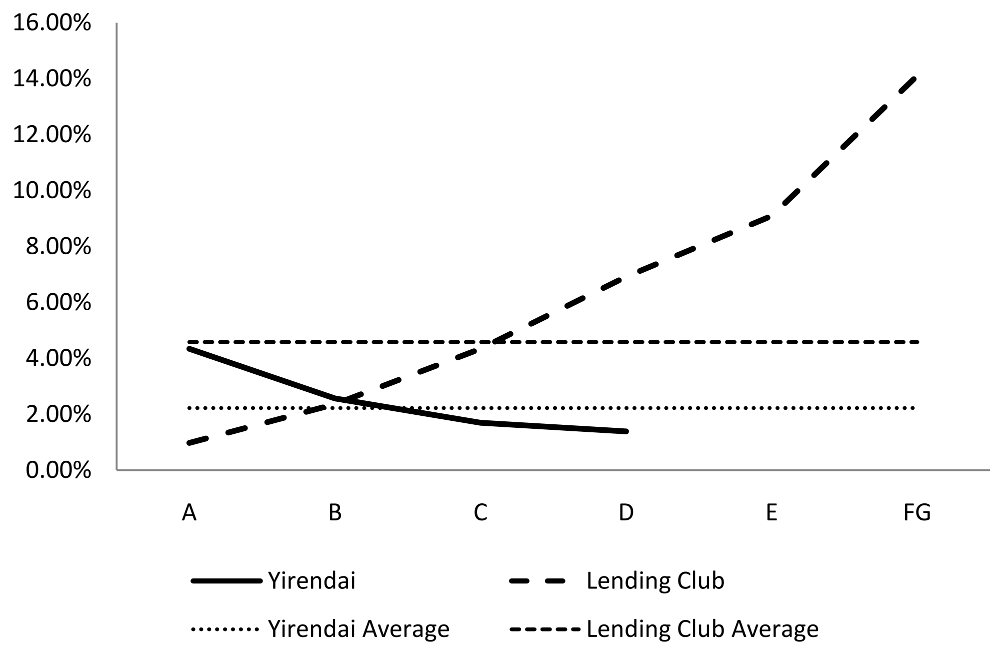

Figure 2: Total Net Charge-off Rate of Loans Initiated in 2013 to 2015. Note: Data come from Yirendai's F-20 filling for FY2015 on EDGAR and Lending Club's website (https://www.lendingclub.com/info/demand-and-credit-profile.action). The total net charge-off rate of each investment grade is calculated as the total net charge-off amount of that grade's loans initiated in 2013 to 2015 divided by the total amount of corresponding loans. Yirendai has four investment grades (A, B, C, D) with Grade A representing the lowest default risk and Grade D representing the highest default risk. Lending Club has seven grades with Grade A representing the lowest default risk and Grade G representing the highest default risk.

Finally, we investigate the credit risk assumption in the US and Chinese OML platforms. In the US, LC issues notes as a means to allow lenders to invest in the loans,[xvi] however it makes clear that the platform "does not assume any credit risk and the lenders can only receive the actual amount received by the Lending Club from the borrower, subtracting the service fees". In cases of default, LC can pursue collection efforts on lenders' behalf, subject to additional service charge.

YRD, on the other hand, adopts a "risk reserve fund" to provide guarantee on both principals and returns of investors. It discloses that the company has set up a provisional fund with a custodian bank. For each loan successfully originated on its platform, the company adds to the provisional fund an amount equal to a pre-determined percentage of the loan amount. This guarantee is not free: YRD charges each loan investor 10% of their monthly interest return for this compulsory service.

V. Sources of Chinese OML Platform Failure: Empirical Analysis

This section employs a unique proprietary data-set to study the Chinese OML industry. Our objective is to systematically compare characteristics of "failed" and "normal operating" platforms, and draw inferences about factors that can predict platform failure. This exercise is useful for managers and regulators to identify fraud risk and monitor platforms on a timely basis. Data are obtained from Wangdaizhijia (http://www.wdzj.com), China's leading OML monitoring and research institute.

A few other empirical studies use transactional data from one platform (e.g. Prosper, LC, or PPDai) to study the P2P lending market, and their key variables of interest are loan accessibility, pricing terms, and borrower default rate.[xvii] Our study differs from theirs in that we study platform failure risk, and our data contain platform-level characteristics at monthly frequency. We use monthly data because OML in China has only a recent origin since 2010, and most OML platforms were set up after 2013. Moreover, a non-trivial number of platforms failed within one year, thus using platform-month as unit of observation allows us to capture the true picture of Chinese OML industry.

Our sample comprises 735 unique platforms and 9,556 platform-month observations with complete variables data from 2011 to 2015. Of the 735 platforms, 476 failed at different stages during the sample period. Although our sample does not cover all the platforms, it is by far the most comprehensive and complete record of platform level data on China's OML market.

Table 1 presents the distribution of our sample. Panel A presents the provincial distribution, and Panel B presents the yearly distribution. Over a quarter of our observations come from Guangdong province. In terms of absolute number of failures, Shandong, Guangdong and Zhejiang ranked top three. In terms of failure rate, Hainan, Shandong and Jilin are the three highest provinces.

Most of observations are in 2014 and 2015. The number of observations increases monotonically with time before 2014, and decreases slightly due to massive platform failures in 2015. The failed platform-months account for 4.98% of the sample. Over a half of the failures occurred in 2015.

Table 1: Sample Distribution

Panel A Provincial Distribution				
Province	Obs.	% of Total Obs.	No. of Failures	Failure Rate
Anhui	278	2.91%	22	7.91%
Beijing	1264	13.23%	21	1.66%
Chongqing	167	1.75%	9	5.39%
Fujian	252	2.64%	15	5.95%
Guangdong	2439	25.52%	73	2.99%
Guangxi	89	0.93%	7	7.87%
Guizhou	133	1.39%	5	3.76%
Hainan	20	0.21%	3	15.00%
Hebei	73	0.76%	5	6.85%
Heilongjiang	25	0.26%	1	4.00%
Henan	145	1.52%	10	6.90%
Hubei	346	3.62%	10	2.89%
Hunan	208	2.18%	20	9.62%
Inner Meng.	31	0.32%	2	6.45%
Jiangsu	467	4.89%	28	6.00%
Jiangxi	229	2.40%	7	3.06%
Jilin	14	0.15%	2	14.29%
Liaoning	44	0.46%	2	4.55%
Ningxia	20	0.21%	0	0.00%
Shandong	857	8.97%	124	14.47%
Shanghai	802	8.39%	22	2.74%
Shanx	52	0.54%	1	1.92%
Shanxi	40	0.42%	1	2.50%
Sichuan	457	4.78%	21	4.60%
Tianjin	37	0.39%	4	10.81%
Yunnan	46	0.48%	0	0.00%
Zhejiang	1021	10.68%	61	5.97%
Total	9556	100.00%	476	4.98%
Panel B Yearly Distribution				
Year	Obs.	% of Total Obs.	No. of Failures	Failure Rate
2011	29	0.30%	7	24.14%
2012	136	1.42%	12	8.82%
2013	465	4.87%	12	2.58%
2014	4560	47.72%	181	3.97%
2015	4366	45.69%	264	6.05%
Total	9556	100.00%	476	4.98%

Table 2 displays the summary statistics of our sample. The mean of average interest rate for a platform-month is 20.92% with the upper quartile of average interest rate 24.84%. The mean of average loan maturity is 3.57 months, and three fourths of the platform-months have average maturity less than 5 months. This maturity is substantially shorter than the 3-5 years term loans offered in major US OML platforms such as Lending Club and Prosper. Each month, average number of loans initiated is 1,592 and the number of loans outstanding is 1,089. The mean of monthly volume is over ￥81 million ($ 12.46 million), with an average net inflow of ￥19 million ($ 2.92 million). The median amount of loan outstanding is ￥224 million ($ 34.46 million). In terms of bidders and borrowers, the average number of bidders (2,283) for each platform/month is 5.32 times that of the borrowers (429). Also, on the borrower side, the top ten borrowers dominate over half of the loans outstanding, revealing significant risk of under-diversification; on the bidder side, the top ten bidders account for one third of the investment.

Table 2: Summary Statistics

Variable	Mean	STD	Max	P75	Median	P25	Min
M. Volume (in mm)	81.08	432.85	16,232.00	42.51	14.01	4.55	0.00
M. Net Inflow (in mm)	19.49	108.68	3,846.24	6.59	0.53	0.00	-648.19
Loan Outst. Amt. (in mm)	224.73	1,280.85	68,834.03	104.58	27.62	7.97	0.00
Avg. Bidding Size (in mm)	1.46	66.44	6,530.75	0.08	0.04	0.02	0.00
Top 10 Investor Prop.	0.35	0.26	1.00	0.51	0.30	0.15	0.00
Loan Outst. Number	1,089	13,324	709,484	97	29	7	0
Top 10 Borrower Prop.	0.58	0.35	1.00	0.97	0.61	0.29	0.00
M. Loan Number	1,592	20,687	1,428,697	176	67	26	1
M. Avg. Loan maturity	3.57	4.07	61.02	4.10	2.37	1.40	0.00
M. Avg. Interest Rate (%)	20.92	19.34	1599.07	24.84	18.00	13.68	0.00
M. Bidder Number	2283	10225	369343	1010	283	92	0
M. Borrower Number	429	3534	112726	53	17	5	1

To compare characteristics of failed and normal platforms, we conduct three groups of T-tests, which are summarized in Table 3. Panel A of Table 3 reports the comparison between the observations that are one-month before platform failure and the rest observations. The one-month pre-failure observations had lower monthly net inflow (t=-10.57), loan outstanding number (t=-7.69), monthly loan number (t=-7.05), and monthly borrower number (t=-11.25), and higher top investor proportions (t=5.96). Panel B reports the comparison between the observations that are within 6 months before platform failure and the rest observations. On top of Panel A, the semi-year pre-failure observations display even more concentrated operating figures, and monthly volume (t=-3.10), loan maturity (t=-17.89), interest rate (t=10.08) and monthly bidder number (t=-6.32) become significant differences between failed and normal platforms. Panel C reports the comparison between the observations of failure platforms and the rest of observations, and display more significant differences on the basis of Panel B. In sum, from Panel A to Panel C, we conclude that failed platforms are more inactive (in terms of borrower, bidder and loan number), have higher under-diversification risk (in terms of the % of top 10 borrowers and investors), lower loan maturity and higher interest rate than normal platforms.

Table 3: Characteristics of Failure Firms and Non-Failure Platforms

	Panel A 1-Month Pre-Failure Obs. vs. Other Obs.			Panel B 6 Months' Pre-Failure Obs. vs. Other Obs.			Panel C Failed-Platform Obs. vs. Normal Platform Obs.		
	(1)	(2)	(1)-(2)	(3)	(4)	(3)-(4)	(5)	(6)	(5)-(6)
M. Volume (in mm)	47.14	82.83	-35.69	48.05	90.89	-42.84***	48.05	113.53	-65.48***
M. Net Inflow (in mm)	1.46	19.89	-18.43***	2.96	24.40	-21.44***	3.36	30.82	-27.46***
Loan Outst. Amt. (in mm)	195.70	226.85	-31.15	163.06	243.03	-79.97*	114.45	309.38	-194.93***
Avg. Bidding Size (in mm)	1.21	1.50	-0.29	4.47	0.56	3.91	3.33	0.08	3.24**
Top 10 Investor Prop. (%)	42.73	34.70	8.03***	40.37	33.46	6.91***	38.95	32.17	6.78***
Loan Outst. Number	46	1161	-1114***	43	1400	-1357***	46	1909	-1863***
Top 10 Borrower Prop. (%)	63.50	58.28	5.22***	61.02	57.72	3.30***	60.04	57.40	2.64***

M. Loan Number	75	1652	-1577^{***}	101	2034	-1933^{***}	122	2675	-2553^{***}
M. Avg. Loan maturity	3.09	3.55	-0.46^{**}	2.54	3.87	-1.33^{***}	2.55	4.27	-1.72^{***}
M. Avg. Interest Rate (%)	23.76	20.87	2.89^{***}	26.84	19.16	7.68^{***}	27.56	16.04	11.52^{***}
M. Bidder Number	1059	2348	-1289	890	2696	-1807^{***}	677	3503	-2826^{***}
M. Borrower Number	18	449	-432^{***}	21	551	-529^{***}	25	733	-708^{***}
No. of Obs.	476	9080		2232	7324		4122	5434	

Note: This table presents the comparisons of characteristics between failed platforms and normal platforms. Panel A reports the comparison between the observations that are one-month before platform failure and the rest observations. Panel B reports the comparison between the observations that are within 6 months before platform failure and the rest observations. And Panel C reports the comparison between the observations of failure platforms and the rest observations. T-statistics are calculated with Satterthwaite standard error. The superscripts, ***, **, and * denote the 1%, 5%, and 10% levels of significance, respectively. Column (1): Failed Next-Month=1; Column (2): Failed Next-Month=0; Column (3): Failed Within-6-Month=1; Column (4): Failed Within-6-Month=0; Column (5): Failed-Platform=1; Column (6): Failed-Platform=0.

These results echo many anecdotal evidence on the Chinese OML platform fraud that includes "self-finance" and misuse of investors' funds. We show failed platforms are on average smaller, less active, and tend to offer shorter-maturity loans but higher interest rates to attract investors. On the other hand, these platforms have highly concentrated investor base and large borrowers, exhibiting high under-diversification risk. Most platform failures occurred in 2015 following the Chinese stock market crash and economic downturn, consistent with the interpretation that Chinese OML platforms are "shadow banks" that are very much vulnerable to negative economic shocks.

VI. Regulatory Framework

In the US, OML involves multiple oversight agencies. Borrowers on the platforms are protected by the usury law and extensive banking regulations.[xviii] Loan investors on the platforms are protected by federal security regulations.[xix] At state level, OML is also actively regulated. Some states prohibit platforms from soliciting investors in their states.[xx] Some states have no restriction, and others allow solicitation but only to "accredited" investors. Moreover, Section 989F of the Dodd-Frank Act mandates that the Comptroller General and the US Government Accountability Office (GAO) conduct a study to "determine the optimal Federal regulatory structure" for OML (GAO 2011).

In China, before 2015 there is no special regulation for OML: peer-to-peer lending related disputes fall under the usury law.[xxi] Which are treated as civil contracts between lenders and borrowers,[xxii] with the platform often jointly liable as a guarantor.[xxiii] Platforms that were set up as a sham to solicit funds from loan investors is a criminal offence under the Article 176 of the Criminal Law.[xxiv]

The years 2014 and 2015 witnessed a massive scale of platform failures in China, including several headline scandals. Each failed platform affected large numbers of loan investors, which became sources of social instability. This propelled several important measures directly regulating the OML sector. The first was "Guiding Opinions on Fintech" issued jointly by ten Chinese ministries in July 2015.[xxv] This policy set guidelines for the safe development of China's Fintech industry. It covers not only OML, but also equity crowd funding, internet payment, the online sale of investment funds, insurance, and other financial products. Specifically, it requires OML platforms to "clarify their role as information intermediaries", "not engage in illegal fund raising", and for the first time designate the Central Bank Regulatory Commission of China (CBRC) to be the principal regulator of OML.

In December 2015, the CBRC publicized "Drafted Rules on the Regulation of Online Marketplace Lending Operators" ("Drafted Rules") for public consultation.[xxvi] This 47-article Drafted Rules is seen as setting the regulatory framework of China's OML industry (WSJ 2015). It has two primary objectives: (1) To require all OML companies to redefine their role as "information intermediary" as opposed to "financial intermediary". Platforms are prohibited from receiving deposits, pooling capital, and offering guarantee on investor return; (2) To improve transparency by requiring the minimum disclosures on borrowers, platforms, and loan level information.

Specifically, the Drafted Rules requires each platform to register with the local financial authority and publicize its operational statistics on the site. It also sets the minimum disclosure requirements regarding borrower information that must be made available to lenders.[xxvii] It defines "qualified investors" and stipulates both borrowers' and loan investors' undertakings.[xxviii] Each platform is mandated to screen and verify borrower's information,[xxix] and to provide sufficient risk warning on its site and contracts, which must be "accepted" by the investors.[xxx]

The Drafted Rules also adopted a "negative list" approach by explicitly prohibiting eleven forms of activities on the OML platforms. These activities include: (1) using a platform to raise funds for the founder or its affiliated entities; (2) mixing investors' funds with that of the platform; (3) promising or providing any guarantee on investor return; (4) promoting specific projects to unregistered investors; (5) lending out to borrowers in the name of the platform; (6) splitting the loan maturity; (7) selling funds or other wealth management products on OML platforms; (8) bundling OML with licensing, brokerage, and promotion for any institutional investor; (9) making false statements or material omissions on loan products; (10) facilitating loans whose stated purpose is for stock market investment; and (11) having OML business and equity crowd-funding business on the same platform.[xxxi]

The Drafted Rules provided an 18-month transitional period for the market to be cleaned up and operators to adapt to the new regulations. It is expected that the new rule will level the playing field for Chinese OML platforms, and drive them towards the US model. Provided there is credible enforcement, Ponzi Scheme-like platforms are likely to be cracked down, and small OML platforms that are unable to afford compliance cost are likely to withdraw from the market. Those left in the market would be ones with competitive advantages in acquiring high-quality borrowers, and in addressing information asymmetry between lenders and borrowers. Enhanced transparency in China's OML market is also likely to attract more institutional investors.

VII. Positive Innovation: Leveraging users' Social Network in OML

We have argued that the key to the success of an OML platform is to reduce information asymmetry between lenders and borrowers. In the absence of reliable creditworthiness signals, some OML platforms initiated pilot programs to exploit users' social network to address information asymmetry problems. Micro-finance theories argue that social networks can reduce information asymmetry, either because friends have private information on borrower s*ex ante* or because the monitoring within social networks provides a stronger incentive to pay off loans ex post.

In recent years, social networking sites such as Facebook, Linkedin, and WeChat (the "Facebook of China") have greatly facilitated the creation and maintenance of many social relations and made them highly visible. The ability to leverage social networks is a key advantage of OML over traditional lenders such as banks. Some platforms, such as Prosper, Lending Club, Zopa, Funding Circle and PPDai, increasingly resort to social networks as loan origination and risk management mechanisms. These platforms provide online social networking functions that allow lenders and borrowers to declare friendships with one another, and form groups to foster their own "community", together with benefits such as the ability to broadcast loan requests to friends, and to receive notifications of friends' borrowing and lending activities.

Even better, empirical evidences show that social networks have the potential to facilitate more loans. Using Prosper data, Freedman and Jin (2008) find borrowers' friendship networks were significant predictors of lending outcomes.[xxxii] Lin et al. (2013) find the number of visible friends that a borrower has and the number of friends that actually bid on a loan increase the probability of successful funding of a loan, and reduce both interest rates and default rates. Using data from PPDai, the largest OML platform in China and a pioneer of utilizing social capital to reduce credit risk, Liu et al. (2015) classify a lender's friends on P2P platforms into "pipes" (i.e., lenders are more likely to lend to friends whom they trust), "prisms" (i.e., potential lenders may interpret bids by a borrower's friend as an endorsement, thus more likely to invest), and "relational herding" (i.e., potential lenders are more likely to follow bids from their friends than bids from strangers). Interestingly, the authors find support for both pipe and relational herding hypotheses, but the opposite of the prism effect (that is, friends' endorsements via bidding on a loan negatively affects subsequent bids by third parties). They interpret this finding as a borrower's friend's bid is perceived by potential lenders more as a social obligation toward the borrower, than an endorsement from their information advantage.

A new business model, commonly referred to as "friend lending", was introduced in China in 2015.[xxxiii] Unlike other OML platforms, it capitalizes on users' social capital and network for loan origination. We use the following simple example to illustrate how this model works: assume A wants to borrow and can afford a 15% interest rate. B is a friend of A. Instead of lending to A, B can "forward" A's loan request in its own name but with a lower interest rate, say 10%. C is a friend of B. If C lends to B (at 10% interest rate), B is then able to lend to A (at 15% interest rate). Note in this process, B is a de jure lender to A and borrower to C, but a de facto loan facilitator between A and C. By leveraging his social capital, B is able to earn an arbitrage profit of 5%. This model, if successful, can solve two operational challenges in OML: (1) For loan origination, the "friend lending" model relies on users' social network to facilitate loans, mitigating the fraud risk of the platform to misstate borrowers' quality. (2) For credit rationing, the "friend lending" model relies on users' social capital as collateral, potentially a very powerful source of information on borrower credit risk.

Despite its obvious benefits, experiments to integrate users' social network in OML should be designed with care: First, the degree to which social network can reduce information asymmetry crucially depends on the quality and integrity of such social network. Loosely connected social groups appear to have little endorsement or monitoring effect on borrowers. For example, Prosper Marketplace once initiated a program that provided "group leaders" monetary incentives for loans facilitated by their group members. The intention was to leverage the "friends effect" within groups to facilitate more loans and control credit risk. However, it turned out that group leaders responded to the monetary incentives by expanding the size of their groups. When groups became very large (some over 10,000 members), the reputation and monitoring effects disappeared. The reward program later proved to be a failure and was discontinued by Prosper.[xxxiv]

Second, social networks could reduce or increase information asymmetry between borrowers and potential lenders. Liu et al. (2015) show that potential lenders can interpret the bidding behavior of a borrower's friend as a signal of social obligation, affective bias, or even collusion, rather than an endorsement of borrower's quality. On the other hand, it is an empirical question whether loans between friends are more or less likely to be repaid on time compared with loans between strangers. In sum, we stress that integrating users' social network is a positive innovation that attempts to utilize new sources of data and technology to address the key challenges in OML. However, more work is needed to uncover under which condition is social network most useful in peer-to-peer lending.

VIII. Implications for Managers

Our study on the fraud risk in OML generates two implications for managers: First, in the lending businesses there is increasing reliance on complex quantitative models for credit rationing. However, implementation of these models needs monitoring. When platforms face pressure on loan origination but do not bear the credit risk, moral hazard may override complex models and internal risk control systems. This moral hazard is particularly severe in countries like China, where reliable signals on borrowers' credit is unavailable and lenders rely almost exclusively on the credit rationing by platform loan officers. The regulatory response is to require heightened transparency on all market participants (borrowers, investors, platform operational statistics) and processes (credit decisions, pricing terms, APRs) in clear, simple, and consistent terms. On the other hand, to induce platforms (and their line officers) to exercise diligence in screening and monitoring, we suggest to add the ex post charge-off rate of the corresponding loans to internal performance evaluation of approving loan officers.

The second implication for managers is on the utilization of users' social network in OML. The "friends effect" has the potential to facilitate more loans, and reduce information asymmetry between lenders and borrowers. We foresee the key to its success lies in the platform's ability to foster a close-knit community where friend endorsement and peer pressures are in place. It is anticipated that new business models in this area will constantly evolve, yet monetary incentives shall be handled with care. In other words, social network can be a complement but not substitute for a platform's diligence to screen borrowers.

Supplementary Materials

Author Contributions: Conceptualization, Zhen Lei and Jing Tao Andy Lin; methodology, Zhen Lei; software, Zhen Lei and Ho Kai Chan; validation, Jing Tao Andy Lin, Ho Kai Chan and Ting Rose Dan; formal analysis, Jing Tao Andy Lin,Ho Kai Chan and Ting Rose Dan; investigation, Ting Rose Dan; resources, Zhen Lei; data curation, Zhen Lei; writing—original draft preparation, Jing Tao Andy Lin and Ho Kai Chan; writing—review and editing, Zhen Lei and Ting Rose Dan. All authors have read and agreed to the published version of the manuscript.

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Notes:

1. The number of Chinese online P2P platforms has increased from a merely 10 in 2010 to 3,984 by March 2016, having facilitated ￥1.745 trillion ($ 268.4 billion) in loans. Data are obtained from Wangdaizhijia (www.wdzj.com). In contrast, the Wall Street Journal reports by the end of 2014, the Lending Club http://quotes.wsj.com/LCand Prosper Marketplace, the two P2P platforms that dominate the U.S. market, had cumulatively issued $10 billion worth of loans. In U.K. the top three P2P platforms RateSetter, Zopa and Funding Circle together issued over £700 million in 2014 (Goff 2012).
2. The top three cited reasons for platform failures include outright fraud, suspension of business, and cash flow problems. Data from Wangdaizhijia (www.wdzj.com).
3. For example, the Lending Club requires borrowers to have a minimum FICO score of 660, and Prosper Marketplace requires a minimum FICO score of 640.
4. Other sources of information to determine a borrower's credit include, for example, traditional underwriting statistics (e.g., income and debt obligations), real time business accounting, payment and sales history, online small business customer reviews, and other non-traditional information.
5. Note in the US lenders are purchasing the notes issued by the P2P platform, whose return are based entirely on the repayment of the individual borrower. The loans are not secured by any collateral or third party.
6. See Chaffee and Rapp, supra note 6, (2012): 506, (citing example that as of February 2009, Prosper Marketplace had recovered just over $800,000 of the $39.4 million it had charged off in default.)
7. The company was accused for illegal solicitation, misuse of funds and outright embezzlement (Yap 2016).
8. [2014] Shenzhen Luohu District Court Tribunal 2, No. 147.
9. The platform was dismantled, and Deng was sentenced to jail with a fine. See *Xinhua*, August 12, 2014, <http://news. xinhuanet.com/fortune/2014-08/12/c_126859550.htm> (in Chinese)

10. Yirendai issued its American Depository Shares in the New York Stock Exchange on Dec 19, 2015.
11. See <http://www.getfilings.com/sec-filings/150227/LendingClub-Corp_10-K/>.
12. See <https://www.sec.gov/Archives/edgar/data/1631761/000119312515378434/d852976df1.htm>.
13. For information on how individual's FICO score is calculated, please see <http://www.myfico.com/crediteducation/whatsinyourscore.aspx>. Note Lending Club also has Custom Program Loans which include small business loans, super prime consumer loans, education and patient finance loans and personal loans that do not meet the requirements of Standard Program Loans.
14. Note Yirendai is not a bank thus has no direct access to borrower's personal credit information. Borrower's consent is needed for YRD to check borrower's personal credit report.
15. China hasn't started developing its consumer credit central database until 2004, and that database is not automatically available to non-bank institutions like Yirendai.
16. On its relationship with borrowers, the Lending Club uses an industrial bank to originate loans to borrowers who apply on the Lending Club's website, and it subsequently purchases such loans with funds provided by lenders, enabling lenders to capture their investment return on each loan.
17. For prior empirical studies on OML platforms, see, for example, Freedman and Jin (2008), Lin,Prabhala and Viswanathan (2013), Duarte, Siegel, and Young (2012), and Brass (2015).
18. These regulations include the Bank Secrecy Act, the Electronic Fund Transfer Act, the Electronic Signatures in Global and National Commerce Act, the Equal Credit Opportunity Act, the Fair Credit Reporting Act, the Fair Debt Collection Practices Act, the Federal Trade Commission Act, the Gramm-Leach-Bliley Financial Modernization Act, the Servicemembers Civil Relief Act, the Truth in Lending Act, among others.
19. Federal securities regulations include the Securities Act of 1933 and the Securities Exchange Act of 1934. Notes issued by P2P platform constitute an "investment contract" thus are considered as security (see SEC V. W.J. Howey Co., 328 U.S. 293 [1946]). For example, the Prosper Marketplace was once issued a cease and desist order by the SEC for selling registered securities in 2008. See "Order Instituting Cease-And-Desist Proceedings against Prosper Marketplace, Inc.," *Securities Act Release*, No. 8984, 94 SEC Docket 1913, November 24, 2008 (cease-and-desist order).
20. Note that a few states have gone further to prohibit both investing and borrowing on P2P sites. For example, in the US, for borrowers, 49 states are open to the Lending Club and 47 to Prosper. For investors, 45 states are open to the Lending Club whilst only 32 are open to Prosper. See <http://www.lendingmemo.com/lending-club-and-prosper-states/>.
21. Usury laws set caps on the maximum interest rates that can be levied, beyond which lenders lose legal protection on their loans. Though China does not have specific usury laws, Article 26 of the SPC Provision (ditto) provides that a private loan with interest rate up to 24% per annum is enforceable by the court. For the portion exceeding 24% but below 36%, lenders cannot seek enforcement by the court, but if such interest is already voluntarily paid, borrowers cannot seek court support for return. Any portion of interest rate above 36% per annum is void (paraphrased by the author). It is thus clear that any annual interest rate above 24% has lost de facto legal protection, which loan investors should be aware.
22. In the event of platform failure, a borrower's liability to repay is not discharged as long as the OML contract is legally signed between the lender and borrowers. However, platform failure is often accompanied by a suspension of its service to collect and distribute repayment to multiple lenders. It therefore becomes impossible for individual lenders to recover their "share" of the loan ahead of others. Practically, if the platform encounters cash flow problems but is still able to operate, loan investors shall hold the platform or its designated guarantors accountable for loan recovery, often under the auspices of the public securities bureau. However, if the platform ceases operation, lawyers and external collection agencies often interfere to help collect payment from borrowers and distribute to investors.
23. Article 22 of the Supreme People's Court Provision on Application of Law in the Trial of Private Lending Cases (hereafter SPC Provision) in September 2015 stipulates: "*for private loans generated through an online P2P platform, if the platform merely provide brokerage service, the court shall not support lender's claim for compensation by the platform. However, if the platform provides explicit or implicit guarantee on the loan through its website, advertisement or other media, the platform shall assume guarantor's liability*."
24. In China, Article 176 of the Criminal Law (1997) makes it a crime to "illegally absorb public savings". However, absent clear guidelines this Article is poorly implemented in practice. In January 2011 the Supreme People's Court issued its Opinion on Several Issues concerning the Application of Law in the Handling of Illegal Fund-raising Criminal Cases. Its Article 1 sets four necessary conditions for this criminal liability, they are: (1) absorbing funds without approval by the relevant government departments; (2) public solicitation by means of media, promotional fairs, leaflets or mobile messages; (3) promising repayment of the principal and interests in any form within prescribed period; and (4) absorbing funds from the unspecified, general public.
25. See Chinese Ten Ministries, *"The Guiding Opinions for Promoting the Healthy Development of Fintech*," July 18, 2015, summaries available at<http://www.usito.org/news/pboc-announces-regulations-internet-finance-sector>.
26. See CBRC, "*Drafted Rules on the Regulation of Online Marketplace Lending Operators*", December 28, 2015, available at government gazette (in Chinese) <http://www.gov.cn/xinwen/2015-12/28/content_5028564.htm>
27. See CBRC Drafted Rules, supra note xxvi, article 30.
28. Ditto, article 13, 14 and 15.
29. Ditto, article 9.
30. Ditto, article 26.
31. Ditto, article 10.
32. S. Freedman and G. Z. Jin, supra note xvii, (2008).
33. The leading Chinese company in "friend lending" is Jiedaibao (www.jiedaibao.com) .
34. See <http://prosperlending.blogspot.com/2007/09/prosper-eliminates-group-leader-rewards.html>.

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The Effect of Internal Control Systems on the Financial Performance of Commercial Banks in Rwanda

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Abstract- Internal Control Systems play an essential role in every organization as it assists in the realization of their financial performance goals. Internal controls minimize risks and protect assets, ensure accuracy of records, promote operational efficiency, and encourage adherence to policies, rules, regulations, and laws. The central aim of the research was to reconnoitrer the Effect of Internal Control Systems on the Financial Performance of Commercial Banks in Rwanda. The study was guided by the following goals and purposes; to investigate the relationship between the internal control environment on the Financial Performance of Commercial Banks in Rwanda and to establish the effect of risk management on the Financial Performance of Commercial Banks in Rwanda. Most Commercial Banks in Rwanda in recent years performed poorly due to weak internal control systems, record keeping, financial reporting, and regulatory compliance. The study adopted System Theory and agency theory. The study adopted a descriptive research design using both quantitative and qualitative approaches. The study adopted a target population of 96 and multi-level random sampling of 38 Senior Managers in various categories.

Keywords: internal control systems, financial performance, commercial banks, rwanda.

GJMBR-C Classification: DDC Code: 658.473 LCC Code: HF5686.C7

THEEFFECTOFINTERNALCONTROLSYSTEMSONTHEFINANCIALPERFORMANCEOFCOMMERCIALBANKSINRWANDA

Strictly as per the compliance and regulations of:

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Keywords: internal control systems, financial performance, commercial banks, rwanda.

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I. Introduction

Internal controls are a company-wide system of policies and procedures that provide some assurance that the company is operating effectively, and that all applicable laws and reporting processes are sound [1]. For large multinational corporations, the system of internal controls could involve dozens of layers of interconnecting controls that range from corporate ethics manual down to an input control in a database that makes sure the product identification number entered in the inventory system is valid.

From a global perspective, a global financial crisis highlighted the importance of a well-functioning and healthy banking sector for macro stability [2]. One of the main reasons for banking failures is a poor risk management system which results in significant financial loss and even bankruptcy for financial institutions across the globe. The lack of an internal control system to keep the risks under control or major breakdowns within an existing internal control system poses a threat to the success of the banking sector [3]. The ambiguity of the Control requirements is inevitable given China's background. China's institutional environment is considered relatively weak, lacking stringent enforcement [4]. Robust internal control systems and periodic audits are essential to preventing fraud when running a company in China [5].

From a regional perspective, the effect of internal controls on the Financial Performance of manufacturing firms in Kenya discovered that manufacturing firms that had invested ineffective internal control systems had a more improved financial performance as compared to those manufacturing firms that had weak internal controls [6]. In Kenya, weak internal controls activities and a lack of proper information and communication systems have encouraged conspiracy to fraud, loss of revenue, and embezzlement of collected revenue among the county governments [7]. Risk assessment is the process of identifying and analyzing management's strong risks to the preparation of financial statements that would be presented fairly in conformity with generally accepted accounting principles [8]. Risk assessment involves the use of systematic procedures to identify and analyze relevant risks and the subsequent management of those risks.

From national a perspective, the Rwandan government started to recognize the importance of the internal audit function, the reason why the Ministerial Order N°002/09/10/GP/A of 12/02/2009 set out rules and regulations for internal controls. The internal audit which is the integral component of internal controls was identified as one of the key players in promoting corporate governance. Strong internal control is one of the best defenses against business failures and an important driver of business performance. Internal controls help an organization attain its objectives by assembling a systematic, disciplined approach to evaluate and improve the effectiveness of the risk management process hence the promotion of financial performance[9]. The research focused on internal controls as a tool for mitigating risk management to promote financial performance in commercial banks in Rwanda.

II. Statement of the Problem

Globally, financial scandals have been witnessed triggering reactions for tighter regulation and enhanced standards for accounting and corporate governance. In America, scandals such as World.com and Enron in the year 2002 were 11 investors lost over $180 billion led to the enactment of the Corporate and Auditing, Accountability and Responsibility Act (Sarbanes–Oxley Act, 2002). These major financial scandals were caused by poor internal control systems including weak corporate governance which the Sarbanes Oxley Act of 2002, tried to address. A large scandal involving the public company Enron showed the American public and its representatives in Congress that new compliance standards for public accounting and auditing were sorely needed. Enron was one of the biggest, and, it was thought, one of the most financially sound companies in the U.S.

In Rwanda, the micro-finance sector has achieved tremendous growth over the past few years, with the number of players increasing close to 100 MFIs presently. The growth is however being threatened by the rising rate of non-performing loans (NPLs). The study indicates that registration fees for collateral at Rwanda Development Board (RDB) of up to Rwf 20,000, and Rwf1,500 contract notification charges a page were hurting commercial banks. The situation, according to the report, is compounded by a limited number of Commercial Courts to handle cases related to bad loans, and Rwf 50,000 judicial fees that small loan defaulters pay, among others. Additionally, many commercial banks were witnessed undergoing insolvency due to higher levels of non-performing loans (BNR, Financial stability report 2008). Initially, the banking sector and particularly commercial banks in Rwanda have faced a lot of problems like lack of resources, political uncertainty, lack of skilled human resource, and socioeconomic catastrophe, high nonperforming loan affects the profitability of the bank, which affected the efficient working of Commercial banking sector. Indeed, good performance and stability of a bank lie at the heart of confidence in the banking system due to the highly leveraged nature of banks. Individual banks' financial problems can have significant implications for the whole financial system. BPR represented 46% losses of shares capital for the annual financial report, 2009, 2012, and 2013. While BCR made losses worth 55% in 2012.

Rwandan banks are faced with increasing competition and rising costs because of regulatory requirements, financial and technological innovation, entry of large foreign banks into the retail banking environment, and challenges of the recent financial crisis. In the Rwandan economy, studies done relating to internal control systems and financial performance do not show directly the effect of corporate governance and government policy on the financial performance of commercial banks [10]. This study, therefore, focused on a wider scope of commercial banks sought to fill existing research gaps in determining the Effect of Internal Control Systems on the Financial Performance of the Commercial Banks in Rwanda

III. Objectives of the Study

a) General Objective

The general objective of this study was to the determine effect of Internal Control Systems on the Financial Performance of Commercial Banks in Rwanda.

b) Specific Objectives

The specific objectives of the study were:

1. To establish the effect of the Internal Control Environment on the Financial Performance of Commercial Banks in Rwanda.
2. To determine the effect of Risk Management on the Financial Performance of Commercial Banks in Rwanda

c) The Research Hypotheses

The research hypotheses of the study were:

H0: There is no relationship between the Internal Control Environment on the Financial Performance of Commercial Banks in Rwanda.

H0: There is no relationship between Risk Management Control on the Financial Performance of Commercial Banks in Rwanda

IV. Theory

a) Systems Theories

Systems theories are based on the belief that individuals do not operate in isolation, but rather grow and develop in interaction with their physical and social environment [11]. Systems theories derive from general systems theory, which explores the parts of a system that interconnect and interact to make a complete whole. Within social work, systems can constitute individuals, couples, families, communities, organizations, society, and the world. Systems theories hold that each system should be viewed as consisting of several elements that make the system a functional whole, and each system should be viewed as the other systems that can cause a change or reaction within the main system. For example, when working with clients, social workers should consider the bio-psycho-social aspects of the client by looking at physical and psychological functioning, social relationships, and community or societal structures that impact the client [12].

The life model of social work practice was greatly influenced by system theories as well as the person-in-environment perspective [13] both of which examine how social work is a unique discipline, in that it focuses on the point where individuals interact with their environment. Such systems theories aim to move social work practice away from focusing solely on the individual, such as with development theories, psychodynamic theories, and behavioral theories and instead focus holistically on the individual within her/his environment (often referred to as human behavior in the social environment). Consideration of the environment includes the physical space, the social context, and the individual's culture and history. The aim of systems theories is to create homeostasis, or a favorable person-environment fit, in that the individual interacts and responds to her/his environment where interactions and change are contributing to positive growth and development and social functioning [14].

Family systems theory adapted the main concepts of general systems theory in understanding and working with families. The family is viewed as a system with each family member playing a critical part. Family systems theory holds that a change in one part of the family system will create a change in other parts of the family system, yet this is often variable depending on the boundaries of the family, the patterns, messages, and rules of the family, and the family's responsiveness to change [15]. The effect of the systems theory in management is that managers look at the organization from a broader perspective. Systems theory has a new perspective for managers to interpret patterns and events in the workplace. They recognize the various parts of the organization, and, in particular, the interrelations of the parts, for example, the coordination of central administration with its programs, supervisors, and workers, among other variables. In traditional management practices, managers typically took one part and focused on it [16].

Systems theories are useful to social work practice as they provide a theoretical basis for assessing a client holistically by examining all the systems within her/his environment [17]. Such theories are primarily used in the assessment and intervention stages of social work practice where the social worker assesses the client holistically by considering psychological, biological, and social functioning, as well as assessing the interaction of other systems within the client's environment, particularly those that could be contributing to the presenting problem. Based on the assessment, underpinned by systems theory, the social worker determines which system needs the intervention. Although the client may be an individual, the social worker may deem the family system, community system, or even political systems as the focus of intervention. Interventions most commonly used in social work practice include couple and family therapy, family systems therapy, community development, and community practice [18].

The theory was therefore very relevant in this study as shareholders who are the owners of the quoted companies have delegated the responsibilities of the daily running of the companies to the management who acts as their agents and hence the great need for strong internal control systems to ensure shareholders and other stakeholder's interests are adequately safeguarded [19]. The theory, therefore, supports the existence of a controlled environment, internal audit, and risk management

b) Agency Theory

Agency theory has been widely used in literature to investigate the information asymmetry between principals (shareholders) and agents (management). This study used the agency theory to determine the effect of internal control systems on the financial performance of quoted companies in the Nairobi securities exchange[20], stating that according to the agency theory, a company consists of a set of linked contracts between the owners of economic resources (the principals) and managers (the agents) who are charged with using and controlling these resources.

A significant body of work has been undertaken in this area within the context of the principal-agent framework. Agency theory identifies the agency relationship where one party, the principal, delegates work to another party, the agent. Argues that agency theory also provides a useful theoretical framework for the study of the internal auditing function [21]. Proposes that agency theory not only helps to explain and predict the existence of internal audit but that it also helps to explain the role and responsibilities assigned to internal auditors by the organization, and that agency theory predicts how the internal audit function is likely to be affected by organizational change. Concludes that agency theory provides a basis for rich research which can benefit both the academic community and the internal auditing profession.

Agency theory is used to understand the relationships between agents and principals [22]. This leads to the principal-agent problem. The principal-agent problem occurs when the interests of a principal and agent come into conflict. Companies should seek to minimize these situations through solid corporate policy. The agency relationship can have several disadvantages relating to the opportunism or self-interest of the agent: For example, the agent may not act in the best interests of the principal, or the agent may act only partially in the best interests of the principal.

There can be several dimensions to this including, for example, the agent misusing their power for pecuniary or another advantage, or the agent not taking appropriate risks in pursuance of the principal's interests because the agent views those risks as not being appropriate while on the other hand, the principal may have different attitudes to risks [23].

There is also the problem of information asymmetry whereby the principal and the agent have access to different levels of information; in practice, this means that the principal is at a disadvantage because the agent has more information. The theory was therefore very relevant in this study as shareholders who are the owners of the quoted companies have delegated the responsibilities of the daily running of the companies to the management who acts as their agents and hence the great need for strong internal control systems to ensure shareholders and other stakeholder's interests are adequately safeguarded [24]. The theory, therefore, supports the existence of a controlled environment, internal audit, and risk management. The agency theory offers a solution to problems arising where there's a clash of interests between a principal and an agent. It however requires that one party concedes to the other. Keep reading to learn more about the agency theory and how it applies in business.

V. Methodology

a) Research Design

A research design is a road map or a plan of research to be used to answer the research questions and research objectives. It is the structure or framework to solve a specific problem. It gives direction and systematizes the research. It refers to the process that the Investigator will follow from the inception to the completion of the study [25]. A research design is the determination and statement of the general research approach or strategy adopted/for the project. It is the heart of planning. If the design adheres to the research objective, it will ensure that the client's needs will be served.

A survey research design is a process of collecting information from a sample of people who have been selected to represent a defined target population. In survey research design, a researcher collects information that describes, explores, and quantifies social phenomena, particularly issues, conditions, and problems that are prevalent in society at a particular point in time [26]. The study collected information relating to internal control systems and the financial performance of commercial banks in Rwanda. The variables that were examined include control environment, internal audit functions, risk management control, and internal control activities. This study adopted a survey design because it was easy and convenient to be conducted through interviews or questionnaire instruments, or both. In this study, both instruments, i.e. self-administered interview guides and questionnaires were employed as appropriate[27].

b) Population

A population is an entire group of individuals, events, or objects having a common observable characteristic. In other words, the population is the aggregate of all that conforms to a given specification. The population is the entire group of objects of interest from whom the researcher seeks to obtain the relevant information for the study [28]. They contend that a population of study should possess a characteristic that meets a researcher's study interests. The population of this study focused on the list of commercial banks in Rwanda.

c) Sampling Frame

The sampling frame comprises a comprehensive list of all the sampling units from which a sample could be selected. A sampling frame is required to define the universe (population). The frame (data sources) could be a list of households, establishments, and industries with detailed addresses, products produced and/or consumption, expenditure, revenue data, and so on [29]

d) Sample Size and Sampling Technique

Sampling may be defined as the selection of parts of an aggregate or totality based on which judgment or inference about the aggregate or totality is made [30]. It is the process of obtaining information about an entire population by examining only a part of it. Sampling is commonly used in inferential statistics to make predictions on the behavior of the population. Using sampling techniques, a researcher is guaranteed that the characteristics of the population are accurately reproduced in the sample [31]. The study used a stratified random sampling technique since the population was not homogeneous and could be subdivided into groups or strata to obtain a representative sample. Stratified random sampling involves dividing the population into homogeneous subgroups and then taking a simple random sample in each subgroup making it possible to make reliable estimates for each stratum as well as for the population as a whole [32] Stratified sampling will be employed whereby the following procedure was followed:

Table 5.1: Target Population

S. No.	Names of Commercial Banks	Population	Sample Size
1	Access Bank Rwanda	13	4
2	Bank of Kigali	12	6
3	Commercial Bank of Rwanda	12	3
4	Banque Populaire du Rwanda SA (BPR)	12	5
5	Compagnie Générale de Banque (Cogebanque)	11	3
6	Eco bank	9	3
7	Equity Bank	11	3
8	Fina Bank	9	4
9	Banque de l'Habitat du Rwanda	6	3
10	Kenya Commercial Bank	6	4
Total		96	38

n = (z2 PQ)/d was applied. This is in line with a statistical technique for selecting a sample from a population of less than ten thousand. The model is derived as follows:

$$n = (z2\ PQ)/d$$

Where:

n = is the desired sample size when the target population is > 10,000.

z = standardized normal deviations at a confidence level of 95% which is 1.96.

p= the proportion in the target population that assumes the characteristics being sought.

In this study, a 50:50 basis is assumed which is a probability of 50% (0.5).

q = The balance from p to add up to 100%. That is 1-P, which in this case will be 1- 50%
(0.5).

d = Significance level of the measure, that is at 90% confidence level the significance level is 0.1. Using the above formulae, the number of companies to be sampled was calculated as below.

$$n = (1.962 \times 0.5 \times 0.5)/ (0.1)2$$
$$= 96$$

The target population in this study is less than 10,000, thus the sample of 96 was adjusted using the formula:

nf = n/(1+n/N) where nf is the desired sample size when the sample size is less than 10,000 and n is the sample size when the target population is more than 10,000. N is the target population size.

$$nf = n/(1+n/N) = 96/(1+96/62) = 38$$

Using the above formulae, the number of commercial banks to be sampled was reduced to thirty-eight (38), and thereafter purposive sampling technique was used to select them from the strata. By apportioning the companies in every stratum, the number of companies to be sampled in every stratum was calculated as indicated above. From the 38 commercial banks earmarked for sampling, the study targeted 6 key Senior Managers in every commercial bank who head various key departments/functions namely the Chief Executive officer, Head of Finance, Head of Audit and Risk, Head of Human Resources, Head of IT and Head of Legal unit. The interest of this population was driven by the fact that this category of the managers are the key custodian and owners of the internal control systems and above all, they have great knowledge and expertise in the working of internal control systems in their companies.

e) *Data Collection Instrument*

The study collected both primary and secondary data. Primary data was collected using a structured questionnaire that is comprised of two sections. The first part collected information on the demographic characteristics of the respondent, while the second part consisted of questions where the variables of the study were focused. The structured questions were used to conserve time and money as well as to facilitate easier analysis of data. Unstructured questions were also included in the questionnaire to encourage the respondent to give an in-depth and felt response without feeling held back in revealing any information.

VI. Data Processing and Analysis

Table 6.1: Distribution of Respondents by Age

Age	Frequency	Percent
20 -30yrs	15	24
31-40 yrs	13	21
41-50 yrs	12	19
51-60 yrs	13	21
Over 60 yrs	9	15
Total	62	100

The findings above indicate that majority of the respondents in the region were of the age-group 20 -30 years (24%) while the least age group was above 60 years (15%), the age group between 31-40 years were (22.2%), while 21% and 19% were of the age group 41-50 and 51-60 years respectively. This shows that the sample used by the study (3%) was distributed in terms of age and could therefore give reliable information. It also attributes that (24%) of the respondents were between 20 and 30 years which is usually the productive age group hence improved organizational performance. Furthermore, the researcher attributed this trend to the fact that most people in the training retire before they reach 65yrs

a) *Descriptive Analysis for Internal Control Environment*

Table 6.2: Respondents' Opinion on Internal Control Environment

Respondents' opinion	Strongly agree	Agree	Neutral	Strongly disagree	Disagree
Management analyses the risks and potential benefits of a venture before making a decision	50	40	5	3	2
Management has mechanisms to anticipate, identify and react to events that affect achieving company objectives	45	40	10	2	3
Turnover of key personnel is relatively low	40	35	15	3	2
Management and Operating decisions are not dominated by a few individuals	35	40	16	4	5
The organizational structure appropriate for the size and complexity of the entity	30	40	20	5	5
There is a clear assignment of responsibility and delegation of authority	30	45	15	5	5

The study sought to investigate if the Management analyse the risks and potential benefits of a venture before making a decision, the result as shown in table 6.2, indicated that the majority (50%) of the respondents strongly agreed that the company's Management analyzes the risks, 40% agreed, 5% were neutral while an equal 5% of the respondents disagreed and strongly disagreed with the statement respectively. Based on the above statement as indicated by the majority of respondents 90% (strongly agreed and agreed) that risk analysis is a proven way of identifying and assessing factors that could negatively affect the success of a business or project.

Further on the opinion about whether the Management has mechanisms to anticipate, identify and react to events that affect achieving company objectives, most of the respondents (45%) agreed that the Management has mechanisms to achieve company objectives, 40% strongly agreed while 10% were neutral. Only 3% and 2% of the respondents disagreed and strongly disagreed respectively. Based on respondents' views, the Management has mechanisms to anticipate, identify and react to events that affect achieving company objectives.

As to whether the Turnover of key personnel is relatively low, 40% of the respondents strongly agreed, 35% agreed, 15% were neutral and 5% disagreed with the statement. Based on respondents' views majority highlights that Turnover of key personnel is relatively low. High turnover rates do not always mean that you have bad managers or that you are not a great place to work [33]. Firms with great brands and industry visibility are often the target of recruiters.

According to the respondent's view, 35% strongly agreed, 40% agreed, 15% were neutral and 5 % disagreed and strongly agreed that Management and Operating decisions are not dominated by a few individuals. This is in agreement with [34] who urged that Individuals tend to think and question before performing. This is fruitful in the analysis and forecasting of an individual's behavior. Individual decision making has certain pros and cons, few of which are mentioned.

The results were that 30% of the respondents strongly agreed that the organizational structure was appropriate for the size and complexity of the entity, 40% agreed, 20% were neutral and 5% disagree, while 5% strongly disagreed with the statement. The result indicates that An organizational structure details how certain activities are delegated toward achieving an organization's goal. It outlines an employee's role and various responsibilities within a company [35].

The results indicate that 35% strongly agreed that there is a clear assignment of responsibility and delegation of authority, 45% agreed, 15% were neutral, 5% disagreed and 5% strongly disagreed with the statements. The results agree with the findings, Authority is the power or right to perform an assignment while responsibility is the obligation given to an individual to accomplish the said assignment [36].

b) Respondent's Risk Management

Table 6.3: Respondents' Opinion on Risk Management

Respondents' opinion	Strongly agree	Agree	Neutral	Strongly disagree	Disagree
There exists a Risk Management Committee in the organization	35	45	10	5	5
The company has a monitoring system that identifies potential risks	40	40	10	5	5
Management uses instruments for risk transfer or sharing with other organizations (e.g. insurance companies)	35	45	20	5	5
The company regularly updates the risk register	42	28	21	4	5
The company management effectively communicates risks to the employees and the stakeholders	38	42	10	5	5
The company has a monitoring system that identifies potential risks	40	35	15	5	5

The results indicate that majority (45%) agree that there is a Risk Management Committee in the organization, 35% strongly agree, 10% were neutral while 10% disagree and strongly with the statement. The results also agree with the findings, Risk management committees are a way for organizations to take a proactive approach to safety. Many non-profit and community-based organizations use a risk management or safety committee to help minimize hazardous issues within their organizations [37].

The majority of respondents (80%) agree and strongly agree that the company has a monitoring system that identifies potential risks, 10% were neutral, and 10% disagree and strongly with the statement. This is in agreement with the findings that Risk identification is important because it is used to create a list of risks the organization is facing. All of the subsequent steps in the risk management process are aimed at the same list of risks [38].

Most of the respondents (80%) strongly agreed that Management uses instruments for risk transfer or sharing with other organizations, 20% were neutral while 10% strongly disagreed and disagreed with the statement. Findings indicate that risk transfer is a common risk management technique where the potential loss from an adverse outcome faced by an individual or entity is shifted to a third party [39]. To compensate the third party for bearing the risk, the individual or entity will generally provide the third party with periodic payments.

Most of the respondents agree and strongly agree (70%) that the company regularly updates the risk register, 21% were neutral while 9% strongly agree and agree with the statement. The findings indicated that The risk register database can be viewed by project managers as a management tool for monitoring the risk management processes within the project [40].

The majority of respondents (80%) agreed and strongly agreed that the company management effectively communicates risks to the employees and the stakeholders, 10% were neutral and 10% strongly disagreed and agreed with the statement. The findings indicate that Communicating information about risk puts all stakeholders, including customers, vendors, and employees, on the same page. It also allows the target audience to better prepare for the risk and mitigate its impact when the risk is understood [41]. Timely and effective risk communication reduces confusion, improves problem-solving, and strengthens decision-making.

The most of respondents (75%) agree that the company has a monitoring system that identifies potential risks, 15% were neutral, while 10% strongly disagreed with the statement. The results also concur with the findings that Understanding risk is also important to project management because with every new project comes new project risk. By crafting an effective risk management strategy, an organization can identify the project's strengths, weaknesses, opportunities, and threats [42].

c) *Multiple Linear Regression for all Variables After Moderation*

The study also aimed at finding out the moderating effect of government policy on the relationship between internal control systems and the financial performance of companies quoted in the Nairobi Security exchange. The model FP= β0+ β1X1+ β2X2+ β3X3+ β4X4+β5X5+ β6X6+ ε explained 96.1% of the variations in financial performance as shown in Table 6.3. The adjusted r changed from 94.1 to 96.1 meaning there is a significant moderating effect of government policy on the relationship between internal control systems and financial performance

Table 4.4: Relationship between Internal Control Systems and Financial Performance Coefficients

Model	Unstandardized Coefficients	Standardized Coefficients	B Std. Error	Beta t Sig.
Internal Control Environment	.120	.056	264	2.144
Risk Management	.229	.064	.338	3.590
a. Dependent Variable: Financial performance b. Linear Regression through the Origin				

Multiple Linear Regression for all Variables After Moderation. The study also aimed at finding out the moderating effect of government policy on the relationship between internal control systems and the financial performance of commercial banks in Rwanda. The model FP= β0+ β1X1+ β2X2+ β3X3+ β4X4+ β5X5+ β6X6+ ε explained 96.1% of the variations in financial performance as shown in Table 4.4. The adjusted r changed from 94.1 to 96.1 meaning there is a significant moderating effect of government policy on the relationship between internal control systems and financial performance

VII. Recommendation

a) *Relationship between Internal Control Environment on Financial Performance of Commercial Banks in Rwanda*

The segregation of duties should be occasionally reviewed to match dynamics in accounting staff. Job rotation should be enhanced to ensure all staff can handle duties in absence of their colleagues. The job description should be modified to include a wider range of activities in the accounting department.

The study also recommends that Management should establish and implement a periodic review of internal audit performance to ensure that its performance and value to the Institution are maximized and to ensure compliance with appropriate standards and guidance. The study further recommends that the head of the Internal Audit department should be a professional accountant and registered with any of the professional accountancy bodies in Rwanda to ensure ethical righteousness. Further, the management should also ensure that their organizations have a strong internal control environment where internal control activities inform policies and procedures are adequate. The control environment and control activities should regularly be evaluated by the internal audit department to provide management with the assurance on the adequacy and effectiveness of mitigation controls that management has put in place.

b) *Relationship between Risk Management and Financial Performance*

The study recommends that there is a need for commercial banks to effectively manage their risk as it was found that risk management positively influences the financial performance of commercial banks. The study further recommends that there is a need for the management of commercial banks to constantly check their banks' exposure to credit risk, insolvency risk, and interest rate sensitivity, as it negatively affects the financial performance of commercial banks. There is a need for the commercial banks to enhance their capital adequacy, size of the banks, and operational efficiency, as it was revealed that capital adequacy, size of the banks, and operational efficiency positively influence the performance of commercial banks in Rwanda.

VIII. Conclusion

a) *Relationship between Relationship Between Internal Control Environment and Financial Performance*

The findings of this research support the findings by concluding that the study concludes that segregation of duties influences the financial performance of commercial banks in Rwanda and this could be through setting up appropriate stages in the accounting process considering the number of accounting staffers in the institution. Checking the work done by the staff who have attended to the document prior, before proceeding to the next task ensures the accuracy of the document. The study concludes internal audit functions influence financial performance. The management control theories underpin findings where internal auditors review the policies and procedures that guide activities of the MFI in operation audit. This is underpinned by stewardship theory. Preparation of financial statements should disclose all necessary material information that is of interest to various stakeholders as advocated in stakeholders' theory. Confirming the argument of the findings of this study suggests that internal control systems are one significant area quoted companies should give attention to enhance their financial performance. Additionally, the findings of this research support the findings of previous researchers. Further, it can be concluded that effective internal control systems must incorporate the effects of corporate governance and government policy to enhance financial performance.

b) Relationship between Risk Management and Financial Performance

The overall results reveal that risk management practices have a statistically significant impact on the financial performance of commercial banks in Rwanda. The results also reveal the trend in risk management practices in another developing economy. This result leads to a recommendation that an adequate risk management system should be put in place by the board of directors which should include the establishment of the company's annual risk limit, risk appetite, and risk strategy to curtail the excessive risk-taking of the management. This system should be reviewed regularly to determine its adequacy, effectiveness, and compliance level of the management with this risk management system

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15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.

- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- o Single section and succinct.
- o An outline of the job done is always written in past tense.
- o Concentrate on shortening results—limit background information to a verdict or two.
- o Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- o Explain the value (significance) of the study.
- o Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- o Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- o Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

The Administration Rules

Administration Rules to Be Strictly Followed before Submitting Your Research Paper to Global Journals Inc.

Please read the following rules and regulations carefully before submitting your research paper to Global Journals Inc. to avoid rejection.

Segment draft and final research paper: You have to strictly follow the template of a research paper, failing which your paper may get rejected. You are expected to write each part of the paper wholly on your own. The peer reviewers need to identify your own perspective of the concepts in your own terms. Please do not extract straight from any other source, and do not rephrase someone else's analysis. Do not allow anyone else to proofread your manuscript.

Written material: You may discuss this with your guides and key sources. Do not copy anyone else's paper, even if this is only imitation, otherwise it will be rejected on the grounds of plagiarism, which is illegal. Various methods to avoid plagiarism are strictly applied by us to every paper, and, if found guilty, you may be blacklisted, which could affect your career adversely. To guard yourself and others from possible illegal use, please do not permit anyone to use or even read your paper and file.

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Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals.

Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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